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EDITED BY A.E. GREENING

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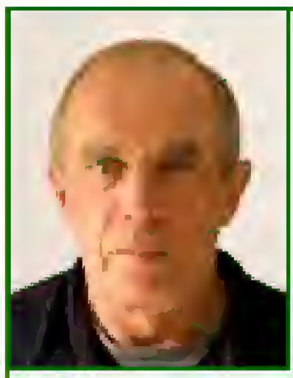
Editorial



My report for the 2015 A.G.M. mentioned that readers should not expect this magazine to be as large as the previous issue. Well I was right, but not in the way that I expected - its even bigger! At 96 pages plus cover this is the biggest yet and possibly at the limit with the postal restrictions on weight. If this trend continues I will be looking for an assistant to help spread the load. If you have access to a software programme called Adobe InDesign and want to help in the production please contact me using the email address below. The same email is to be used for any contact from authors from now on. My broadband provider has changed and I will be losing my present address in the next few months.

You will find that several regular authors have contributed more than one article. The Tree Fern Newsletter has returned, thanks to Mark Longley and several articles have been written by new members, which is an encouraging sign. I have even had to keep one article back for the next issue because there simply wasn't room.

Apologies are due to Bryan Yorke and Alistair Wardlaw for wrongly captioning an image in each article in the last issue. I have reprinted Alistair's book review and managed to sneak in an extra (correctly captioned) picture.

The theme this year appears to be cultivars. Julian Reed had an amazing visit to the Lake District last year, as you will find in the four articles that were produced as a result. Tim Brock has found time to report on his National Collection and Nick Hards continues the theme with some amazing cultivars.

The cover is unusual. Any regular visitor to the B.P.S. web site will have seen Helen's work on pressed fern leaves. Read how they are produced on page 92 and marvel at her skill and dedication. We have linked up with the website for the crossword produced by Mark Longley on page 125. You will find an online version which saves you having to mark your magazine.

My team of proof readers is getting bigger. Many thanks to Roger Amos for coming on board. He certainly has an eagle eye. He joins Chris Evans and Brian Ottway. There is room for more if you are so inclined.

Congratulations to the Hardy Fern Foundation for reaching its 25th year. Sue Olsen tells you how it all started and its subsequent progression on page 132. You will also notice a book review on page 160 for Sue's new book written with Richie Steffen. There is now no excuse for growing ferns to the exclusion of anything else in your garden!

Enjoy this edition. There must be enough to satisfy every member. The variety of articles continues to be as diverse and entertaining as ever. I would like to thank every author for the amazing work they have put into this issue.

Alec Greening

e-mail: Pteridologist@eBPS.org.uk

(Left) Cover Picture: Front
The work of artist Helen Ahpornsiri entitled 'Wonder' made from pressed fern leaves. © Helen Ahpornsiri

(Right) Cover Picture: Back
Based on this picture of *Polystichum setiferum* 'Plumosum Bevis'
(photo: Martin Rickard)

Notes for contributors
Ideally I would like contributions by e-mail or on disc or USB stick (which will be returned), with high resolution images.If this is not possible I will not rule out typed or hand-written copy. In general please follow the style of material in this issue.

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Preview

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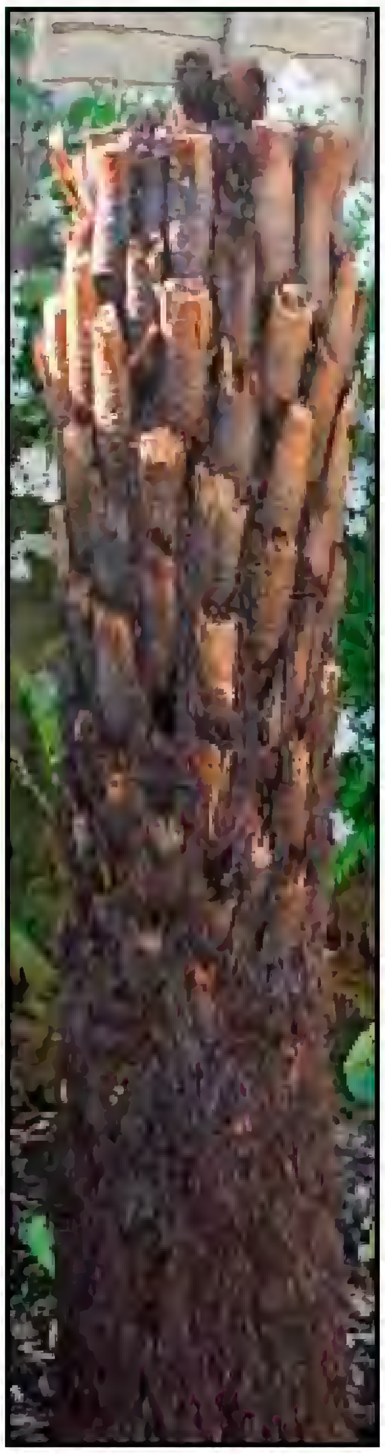

A newly imported trunk of *Cyathea australis* ready for planting
(photo: Chris Callard)

Polystichum setiferum (Bevis Group)
(photo: Gert Jan van der Kolk)

Unless stated otherwise, photographs were supplied by the author of the articles in which they appear

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Longing for the Forked Spleenwort

Brian Russ
9 Crosshall Brow
Westhead
Ormskirk
Lancs L40 6JD

Some years ago the Alpine Society Conference at Bangor was due. Reginald Kaye (Fig.2) had just come home from hospital after a gallstone operation and I was asked if I would collect and take him there. I went up to Silverdale where his wife said to him "You are still waiting to hear if you can go!" but Reg was determined and so we set off.

On arrival he was finding it difficult to sleep because of his drainage tubes. Lady Skelmersdale was in the room next door and we "borrowed" her pillows when she was out of the room. I wonder if she knew where they went!

After the conference Reg asked if we divert the return journey via Llanrwst, as some years ago he had found a colony of *Asplenium septentrionale* at its highest known elevation in N. Wales. He was concerned that the plants might have been taken or damaged. I drove along under his instructions until he suddenly became excited and told me that we were very near. He climbed out of the car, tubes and all, and made his way to a sandstone wall. I will always remember his cry of delight when he found the colony of the forked spleenwort. He had never publicly recorded the exact location and I had never been able to locate it in the past. The colony was flourishing (Fig.1). I occasionally exhibit a specimen of *Asplenium septentrionale* at the Southport Show where it gives me special pleasure of these memories of Reg.

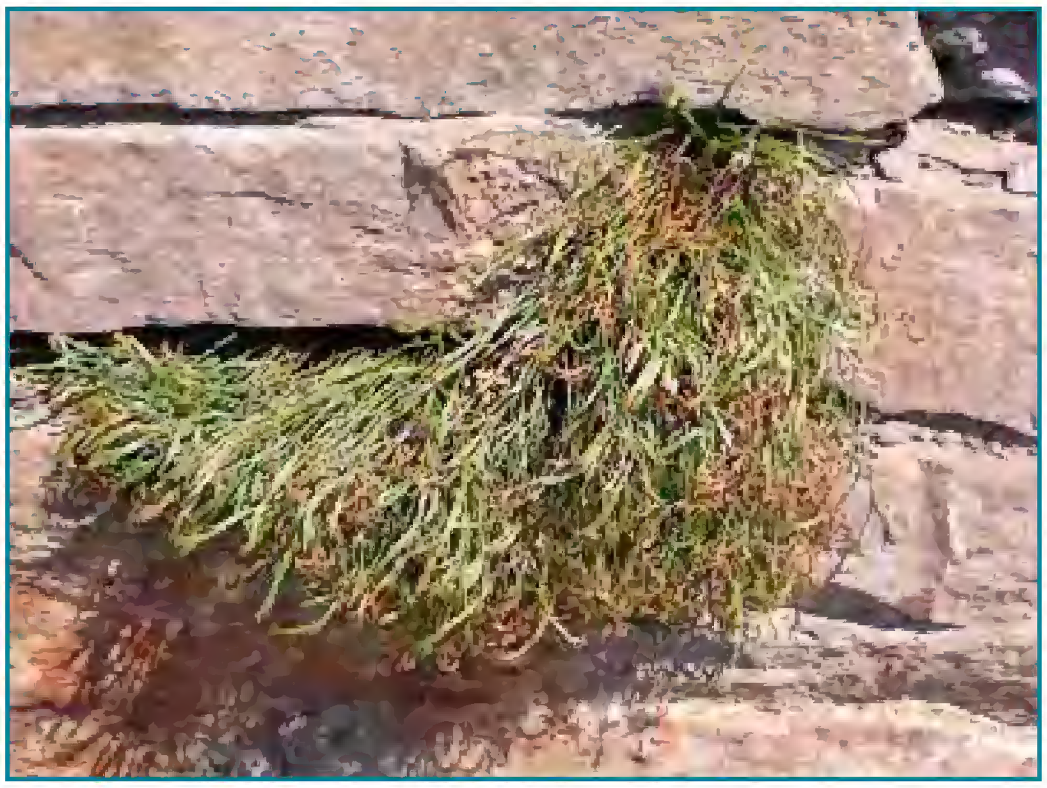

Fig. 1. *Asplenium septentrionale* still growing in the sandstone wall near Llanrwst

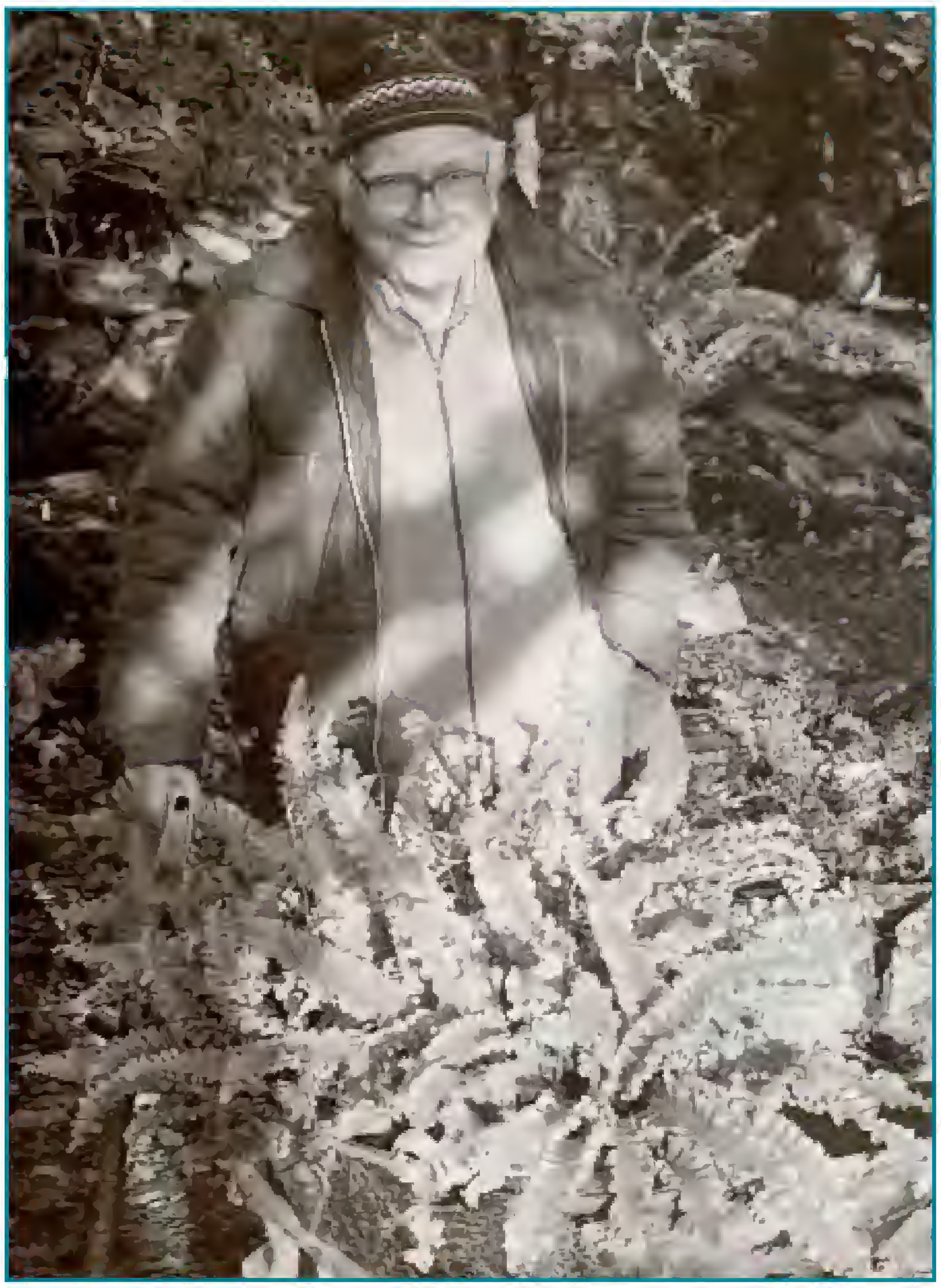

Fig. 2. Reg Kaye, early 1991, at Silverdale collecting together the *Asplenium scolopendrium* cultivars he was providing for the RHS stand celebrating the BPS centenary at the 1991 Chelsea Flower Show
(Photo: M.H. Rickard)

My forked spleenwort was grown from spores obtained from the BPS many years ago. I have lost a few plants but this specimen has slowly built up. It is grown in a gritty ericaceous mix in an open position in an unheated greenhouse. I am fearful of re-potting this plant because it does not like being disturbed. To this end it is double potted with an acid grit infill and small sandstone pebbles as a topping to help retain moisture (Fig.3). My hope is that it can colonise this extra root run.

Returning to Reg. On arriving home we were greeted by Mrs Kaye to say that the all clear letter had arrived and that he could go to Bangor! ❐

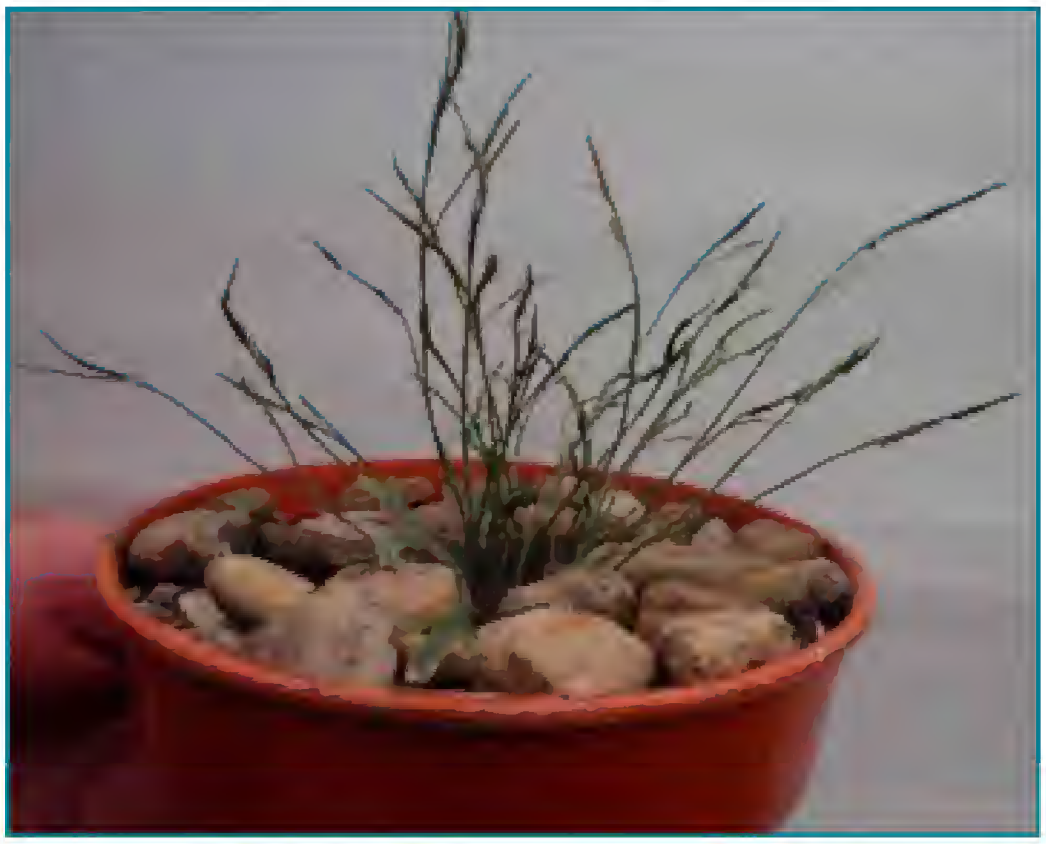

Fig. 3. *Asplenium septentrionale* grown from spores obtained from the BPS. Growing in a double pot in a gritty ericaceous mix. This fern does not like to be disturbed

The discovery, 50 years ago, of the whisk-fern *Psilotum nudum* (L.) P. Beauv. in Europe by Betty Molesworth Allen

Martin Jacoby
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Wellington, Somerset TA21 0HP
e-mail: martincjacoby@gmail.com

"You're not walking slowly because of me, are you?"

"No, Betty, I'm trying to keep up with you."

86 year old Betty Allen and I (then only 61) were crossing the runway into Gibraltar. I forget on what errand, but she had given up driving – or, rather, had her licence withdrawn, to her vocal fury. Betty wasn't normally abrasive but there were some things on which she spoke out forcibly. Indeed, those of us who were privileged to have known her rejoiced in her warm charm, default courtesy and sparkling wit.

Betty kept journals, and they are not easy reading: the hand-writing frequently abbreviates[1], and they flash back in time, muddle entries and include shopping lists, recipes and gossip. Fig. 1 shows the page that includes 9th February 1965. That day reads:

> Lovely day after several days' rain, but Madrid still very dry. Cooler this morning – clear sunny day. Made (1st stage) marmalade sitting in the sun. Not time to do the geraniums which are awaiting pots, and remainder of seeds. Finding new things to do with Seville oranges from Mrs Beeton.
>
> Geoffrey and I out to Devil's Eye[2], [each] with a sore foot. He with a gouty heel, and me with my ankle not yet 100%.> Seeds of *Rhododendron* for Collingwood Ingram. Most finished but some still unopened by stream. *Erica arborea* in bud and *E. australis* dotting the hills and rocks with pink; occasionally another *E. mediterranea* rather brighter by the stream.
>
> *Halimium halimifolium* all yellow flower – two in flower – 1st seen.
>
> *Polygala baetica* probably the first flowers – a few. *Scilla monophylla* now almost fully out, erect and very pretty. Lady's Petticoat *Narcissus bulbocodium* fully out in rock crevices, lovely. *Ornithogallum* sp. (*Asphodelus mic.* I think probably)[3] in bud everywhere.
>
> A rock with a bright (lettuce) green foliose species in crevices. No fruits.
>
> Near here, in a crevice *Psilotum triquetrum*. Not much but locculi nearly mature. Few *Davallia can.* fert., much *Polypodium australis*. Umbellifer *Oenanthe crocata?* in water, very interesting looking leaf only. Gorse *Ulex parviflorus* coming into full flower everywhere.
>
> On the previous Saturday, collected the Broadbents at the 1.15 ferry;[4] it was very cold and we stood with our feet wet in a howling wind and tried to … – I always hate picnics and this did nothing to dispel my belief. …

… and so it went on.

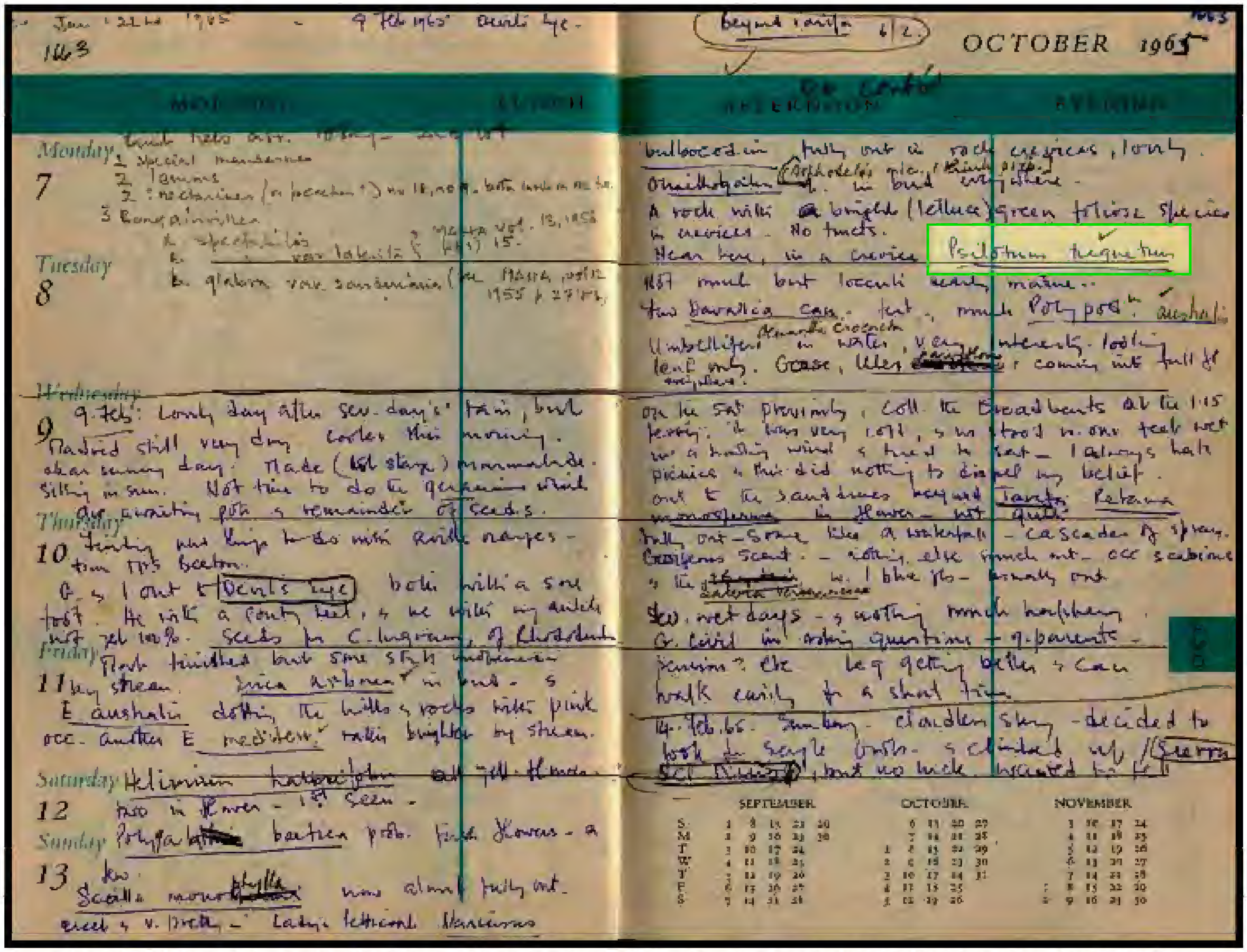

Fig.1. Betty's journal showing the 9th February 1965 entry where *Psilotum triquetrum* (*nudum*) (highlighted) is mentioned at Devil's Eye

The discovery, 50 years ago, of the whisk-fern *Psilotum nudum.*

This matter-of-fact reporting of one of the most significant botanical finds in the generation needs some explanation.

Fig. 2. Betty Molesworth Allen out in the field botanising (photo: J.M. Castle-Smith)

Betty was a Gondwana girl. Several times on our walks together in Spain over the years, she said to me, "At any moment I expect to turn over a log and find *Peripatus*[5]". She was born Betty Eleanor Gossett Molesworth in Otago, New Zealand. Tuberculosis in her early teens confined her to a sanatorium for two years, and obliged her to be educated privately. Then she began part-time work at the Auckland Museum where Lucy Cranwell introduced her to systematic botany and cultivated her growing enthusiasm.

She considered reading natural sciences at Cambridge in England but was defeated by illness. So she moved to Dunedin and took a visitor's seat to read taxonomic botany at the University of New Zealand under Reverend Professor John Holloway. Holloway's speciality was ferns, and it was he that first worked out the life cycle of *Psilotum nudum*. He was a Canon at the Cathedral which Betty attended, and became a powerful influence on both spiritual and intellectual components of her life.

Having cheated at her medical to gain admission, Betty drove lorries for the Royal Air Force during World War II. This sounds worse than it was. In fact, she climbed Mt Cook (3754 m) the day before her medical and ascribed her breathlessness to this. The innocent medic was so impressed that he skipped the lung examination.

After the war, when Lucy Cranwell had married and moved to the United States, Betty became botanist at the Auckland Museum. On the strength of her knowledge of the Pacific flora, she was offered a bursary to work for two years at Basle University, to be followed by field work on the island of New Caledonia.

Realising that she was inexperienced in tropical plants, she planned three months in Malaysia to familiarise herself with them before going to Basle. She arrived there in 1947 and stayed with her cousin David Molesworth. David had been in Changi Prison with the cartoonist Ronald Searle, and there is a suspicion that he was at least partly a role-model for Nigel Molesworth in Searle's books *Down with Skool* and *How to be Topp*. (My wife returned from a visit to him when he lived in Somerset saying that she had found him shooting flies on the side of his house with an airgun.)

Within a year of arriving in Malaya, Betty had met and married Geoffrey Allen. Geoffrey was a merchant with wide experience of India and the Far East – his family had been in the region for four generations. He had risen to Wing Commander in the war, and had already established a firm reputation in ornithology. Betty sent her apologies to Basle, and went to collect plants in Siam and Borneo with Geoffrey who photographed the birds. Together they shared nearly forty years of almost continuous travel and field work, unencumbered with children. He died in 1985.

After their marriage, Betty worked at the Raffles Museum in Singapore helping restore exhibits. The Japanese had saved most of the museum's valuable items but British soldiers had smashed much of what was left when they recaptured Singapore. She made the Botanic Garden in Singapore her centre and was able to use its herbarium, contributing much material to it. She quickly realised that general taxonomy in the tropics was not for her, so she decided to specialise in ferns. She worked closely with the Director of the Botanic Garden, Eric Holttum, and supplied Appendix 2 of his *Ferns of Malaya*. She also sent quantities of fern material to the Smithsonian Institute, to the Royal Botanic Garden at Kew, and to an old friend, Carl Skottsberg at Gottenberg. Tragically, all Skottsberg's fascinating letters to Betty of his travels in South America were lost in a flood in Singapore.

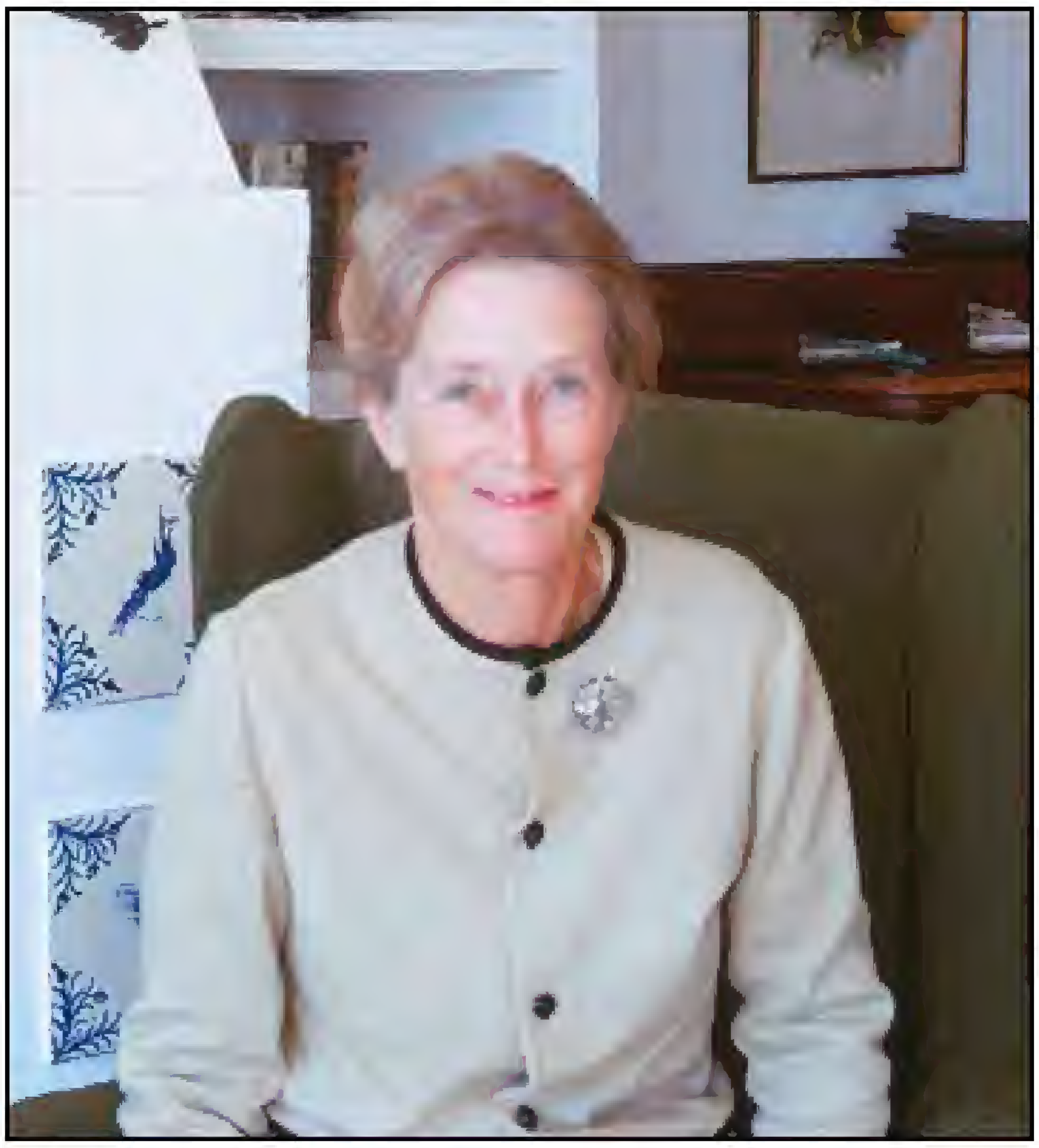

Fig. 3. Betty Molesworth Allen (OBE) relaxing at Finca La Rana, Los Barrios, Spain

The discovery, 50 years ago, of the whisk-fern *Psilotum nudum.*

Back to the *Psilotum* story. After her discovery, Betty wrote to George Taylor, Director of Royal Botanic Gardens, Kew:

> Villa Coca,
> Los Barrios,
> Prov. de Cadiz,
> 26 May 1965 Andalucia. SPAIN
>
> Dear Sir George,
>
> I have collected *Psilotum triquetrum* from Andalucia, but cannot find any reference to it in the recent Flora Europaea.
>
> May I ask if Dr Jarrett could let me know if it is represented in the herbarium from S. W. Spain, and its range in Europe? I expect that it occurs commonly in Morocco, and that the one I have found is this species. I know only of one small patch, but should you wish any, I shall collect it for the herbarium. I have not done so for you may have plenty already.
>
> I should be most grateful for any information on this fern-ally.
>
> Yours sincerely
>
> (Mrs F. G. H. Allen)

On the same day, Betty also wrote another letter to Taylor enquiring about a different form of *Narcissus bulbocodium* which she had just collected in the Coto Doñana. (The World Wildlife Fund had been set up the previous year to acquire this area of dunes and marshes beside the Guadalquivir River and create Doñana National Park.) Taylor replied to both letters on 15th June, the last paragraph referring to *Psilotum*

> Your letter about *Psilotum triquetrum* is extremely interesting, because from a preliminary search of the literature and specimens we can find no trace of any record of this species from Spain or indeed for the genus in Europe. However, it cannot be claimed that this search is thorough, as Dr Jarrett is at present in America, but when she returns about the middle of next month I am sure she will be most interested in your letter, and I shall ask her to give it attention. Without any doubt we should very much like to have material of this species.
>
> With kind regards.
>
> Yours sincerely,
>
> (Sir George Taylor)

Betty's next journal entry for *Psilotum* is 3rd July 1965, and reads

> Below Devil's Eye. Oleander full flower. Most ferns dried up. More *Psilotum* near junction of rivers.

On 30th July, Eric Holttum wrote to Betty about her typescript on *Cyathea* in Malaysia, among other things. His last paragraph reads:

> As regards your suspected *Psilotum*, no species is known in Europe or the nearer parts of Asia. I spoke to Mr Meikle about it, and he wonders whether you have a member of Euphorbiaceae which has very reduced leaves. Are you sure it is *Psilotum*?

Twenty years later, Betty still spluttered with wrath to me about this suggestion.

On 10th August 1965, Dr Jarrett wrote to Betty from Kew:

> Dear Mrs Allen,
>
> The parcel sent with your covering letter of 14th July has just arrived in the herbarium and I have been extremely interested to see the specimen of *Psilotum* from Los Barrios in southern Spain. It is indeed *Psilotum nudum* (L.) Griseb. (*P. triquetrum* Sw.) and thus seems to be a new record for Europe. The species is recorded for the Cape Verde Islands and occurs widely in Africa and the tropics generally, but it is not reported from the Canaries, Madeira or the Azores. The Azores are included in "Flora Europaea" and I can hardly think that any herbarium specimen or record in the literature would have been missed. This is even more unlikely in the case of Spain as the Pteridophyta are included in the first fascicle of V. H. Heywood's "Catalogus Plantarum Vascularum Hispaniae" (1961) and there is no mention of *Psilotum*.
>
> Your find is a considerable achievement as you have added a new Class of the Pteridophyta, the Psilotopsida, to the flora of Europe to stand with the Lycopsida, Sphenopsida (or Articulata) and Felicopsida (otherwise Filices or Pteropsida). The second genus in this group, *Tmesipteris*, is restricted to Australasia and Polynesia.
>
> This record really ought to be published as soon as possible as it will be of general interest. If you were to write a short note for the monthly journal "Taxon" I believe it could be published very quickly. The editor is Dr F. A. Staflen, International Bureau for Plant Taxonomy and Nomenclature, 106 Lange Niewstraat, Utrecht, Netherlands.
>
> Your excellent photographs certainly indicate a natural habitat, but the Cape Verde Islands are about 1600 miles away and *Psilotum nudum* has been quite widely cultivated, so that it would be desirable to give full details of the type of habitat and the distance from any town.
>
> If I can give any further help please let me know,
>
> With kind regards,
>
> Yours sincerely,
>
> Frances M. Jarrett

Posted on the same day is a hand-written letter to Betty from Holttum:

> Prospect 5886
>
> 80 Mortlake Road,
> Kew Gardens,
> Richmond upon Thames
> 10 Aug 1965
>
> Dear Betty,
>
> Thank you for your postcard.
>
> Dr Jarrat showed me the *Psilotum*[6] specimens and exhibited due excitement at your discovery. She has been trying to find evidence of its occurrence in any other of the Atlantic Islands (specimen from Ascension Isl. at Kew).
>
> The earliest name is *Lycopodium nudum* Linn. 1753. Swartz, in establishing the genus *Psilotum* in 1806, published the name *Psilotum triquetrum* & cited Linnaeus's name as a synonym. By the old "Kew rule", *Ps. triquetrum* would be the correct name, as being the first in the right genus; but unless you suppose Swartz or Linnaeus were describing different species, the name *Ps. nudum* (L.) Griseb. should be used – in fact, *triquetrum* is a "superfluous name" because Swartz cited *nudum* as a synonym, & so is "illegitimate". However, I have not looked fully into this matter, & I have not found anywhere a full statement of published names under *Psilotum*.
>
> Cytologists in several countries have examined *Psilotum* plants, and have found diploid, tetraploid or triploid ones ('n - ± 52' in margin of letter), which explains some variation in habit & vigour.
>
> You will doubtless receive suggestions from Kew as to publication of your discovery, which is certainly "news" >

botanically. I agree of course that you do not want to attract a lot of collectors to the locality.

On *Cyathea*, our joint paper, you do not say that you agree to my sending it direct to Singapore for publication. If you can let me know this before you leave for Austria, I will send it off at once.

Yours sincerely,

Eric Holttum

1st October from Frances Jarrett

Thank you for your letter of 13th September and for the manuscript on *Psilotum*, which seems just to fit the bill in providing the right kind of information. I did not realise that you had already prepared it for the Fern Gazette and as I fear it would be too long as it stands for Taxon I got in touch with Mr Jermy and discovered that he hopes to get the next Gazette out in January. If this is achieved there would be very little delay as compared with Taxon and it seems a pity to have to cut the paper down to a mere formal statement. I therefore forwarded the manuscript to Mr Jermy in accordance with what I think where you original intentions and he will be writing to you. Of course it is entirely up to you where it is published but Mr Jermy would evidently like it for the Gazette.

Thank you also for the details of the locality which you are quite right not to publicise. I should love to accept your invitation to see it some time.

I am sorry you were laid low at Kaubath[7]. Several of us suffered more mildly and one rather severely, but we all got home in good order. I was glad to hear that you had got back to Spain safely.

Again it is up to you where you send your Spanish specimens and I will be glad to help as much as possible. However, Mr Jermy is the specialist on European ferns and I know he would be interested to see your material.

P.S. Mr Jermy has received your letter & will be writing. FMJ

Betty decided to publish in *TAXON*, and wrote:

Villa Coca,
Los Barrios, Prov. CADIZ,
Andalucia. SPAIN

Dr.F.A.Staflen,
International Bureau for Plant Taxonomy,
106 Lange Niewstraat,
UTRECHT, Netherlands.
Dec. 28th. 1965

Dear Dr Staflen,

I append a short note on the occurrence of *Psilotum nudum* in Europe which I hope you will find interesting enough to include in your journal "TAXON".

Originally I wrote too long a note for you & Dr Jarrett suggested that I send this to the Pteridological Society of Great Britain for their journal, which I have done. I have therefore written a very brief note here, as I feel that you should be the first to print it, as it concerns the European continent, and I have just learned that the British journal may be out in February.

I enclose a letter from Kew, so that you will not have to take my word for it that it is indeed the plant!

I am familiar with the genus as I have lived in Malaysia where the two species of *Psilotum* are not uncommon. Would you please return my letter from Kew at your convenience?

Yours sincerely,

Betty Molesworth Allen

Note on Psilotum nudum (L.) Griseb. (syn. P. triquetrum Sw.)

I believe this member of the fern allies has not previously been recorded for Europe, the nearest being, I understand, the Cape Verde Is.

In January[8] 1965 I found several patches of this plant growing from deep horizontal fissures of some very large and more or less vertical rock faces.

The area is in S. W. Spain in the province of Cadiz, and is about 12km from the sea, at an altitude of 170m. The rock outcrops lie amongst extensive woods of cork-oak (*Quercus suber*), but sufficiently far from dwellings to consider the *Psilotum* native.

This discovery adds another class (Psilotopsida) to the European Pteridophyta.

Specimen no. 5082 has been sent to the Royal Botanic Gardens, Kew.

B. Molesworth Allen,
Los Barrios, Prov. Cadiz. SPAIN

On a separate slip, Betty wrote:

Dr F. A. Staflen.
The attached letter was omitted in error from my letter of Dec 28th.
B. E. G. Molesworth Allen

Staple holes match the letter from Jarrett of 10th August (above). Staflen wrote on the slip:

Thank you for letting me see this! F.A.Staflen 30/12/65

This is how *Psilotum nudum*, was discovered in Europe. The text of Betty's note was published in *TAXON*, Vol. 15, No. 2 (Feb., 1966), page 82, and it was published in the British Fern Gazette 9 (7), 249 - 250 (1966)

Further entries in Betty's journal are worth reproducing here:

1:11:67 DEVIL'S EYE Last night Prof. Galiano turned up with Dña. Paunero, a charming woman botanist from Madrid (Keeper of Herb who'd lectured on grasses in May) with Dr Valdés and Marie Carmen and her *novio* [fiancé] – and we all went out this morning to Devil's Eye to look at *Psilotum nudum*. They were duly excited at it – many photographs and many exclamations. Went down to the lower place – climbed up rocks – I'm not as young as I was, and found difficulty getting up a place I'd done with ease 2 years ago! Valdés went over the side to see *Osiris alba*. G[eoffrey] worried me immensely by pulling him up the last bit he was able to get to. Remember Emilio Galiano calling encouraging remarks from below – and trying to make him jump!! about 25 feet below. Then D[iana] B[rinton]-L[ee] returned and went with the others.

Betty told me that she had been accused of introducing *Psilotum* herself, having brought it from Malaysia. Galiano had defended her by pointing out phenotypic differences and the inaccessibility of the site. Another entry in Betty's journal describes the status of the colony:

11:2:70 Devil's eye Out to see *Psilotum* was after all the storms. Road not so bad – cold wind. All *Q[uercus]. faginea* bare, alders with catkins: still a lot of water. Lower *Psilotum* increased [to] 42 green living (young and about quite mature) counted here in the two patches. Also many dead and deadish old fronds. Above – much new bright green growth amongst the older yellow ones. Below: mostly all yellow – some of the fronds very large, c. 18"[9] long with the dichotomous head, fert, about 6" or 9" across. Drooping form the crevices. 2 patches with two or 3 stems in crevice slightly east … the lowest. This new? [There are various symbols in the manuscript which possibly show the distribution of fronds.] Above the big patch, which was in a "V" shape was an enormous tight bunch of deep green and yellow fronds c. 2'[10] wide very dense in crevice and small cavity which must get >

> a lot of sun. Rem[ember:] left hand side, an interesting nest, not occupied of course, but may use it again this year. Blue Rock Thrush? These latter places should be safe unless a fire spreads over it, or the shading trees are destroyed. This may be the reason that there are so many obviously similar crevices around the *Psilotum* which have no other growth, but *Ps.* is not there. Above one below, I removed (leaves only) *Allium triquetrum* which had appeared amongst it. Above (4 patches) – the last one (Easterly) and longest seems to be being crowded by *Ruscus hypophyllus*. Should we cut it? Near the *Ps.* plants. Must ask Emilio Galiano what he thinks. So in all, I think *Ps.* Is holding its own, if not even increasing a little – but I wish I could find it elsewhere. App[arently it] will not tolerate competition.

Though a few more colonies have been found in the area, this *locus classicus* was severely reduced when I visited it on 12th October 2014. All the plants I could find are shown in the accompanying photographs. All shading trees have now gone so the ledges in which the *Psilotum* plants grow are in full sun for much of the day.

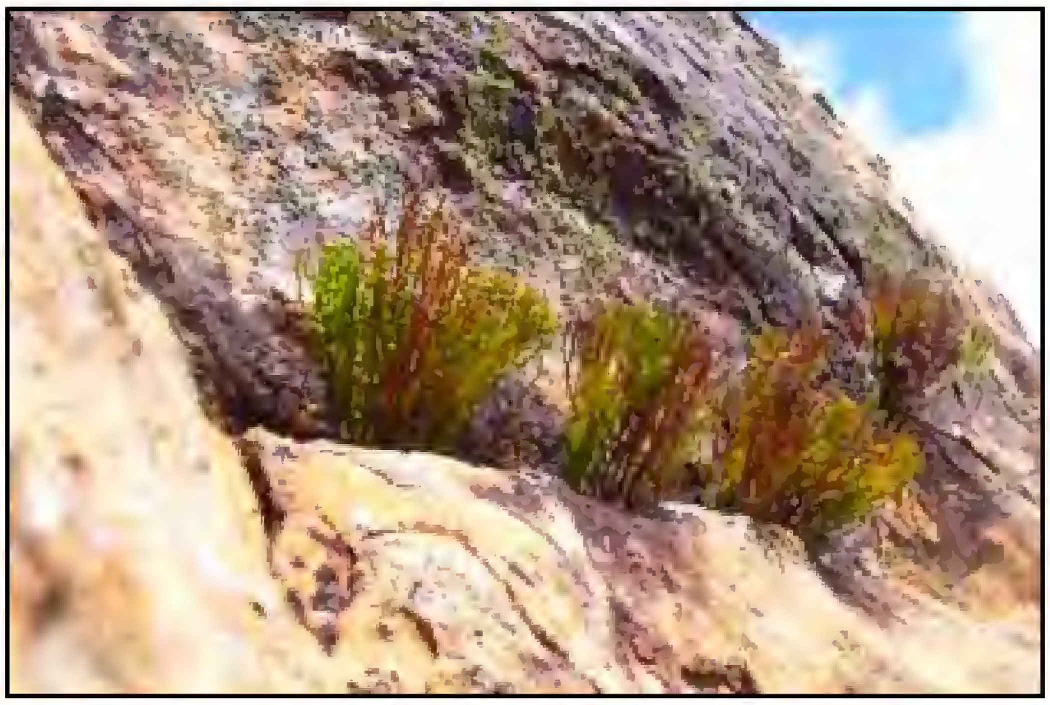
Fig. 4. *Psilotum nudum* in the original site showing how exposed this site has become since the shading trees have gone

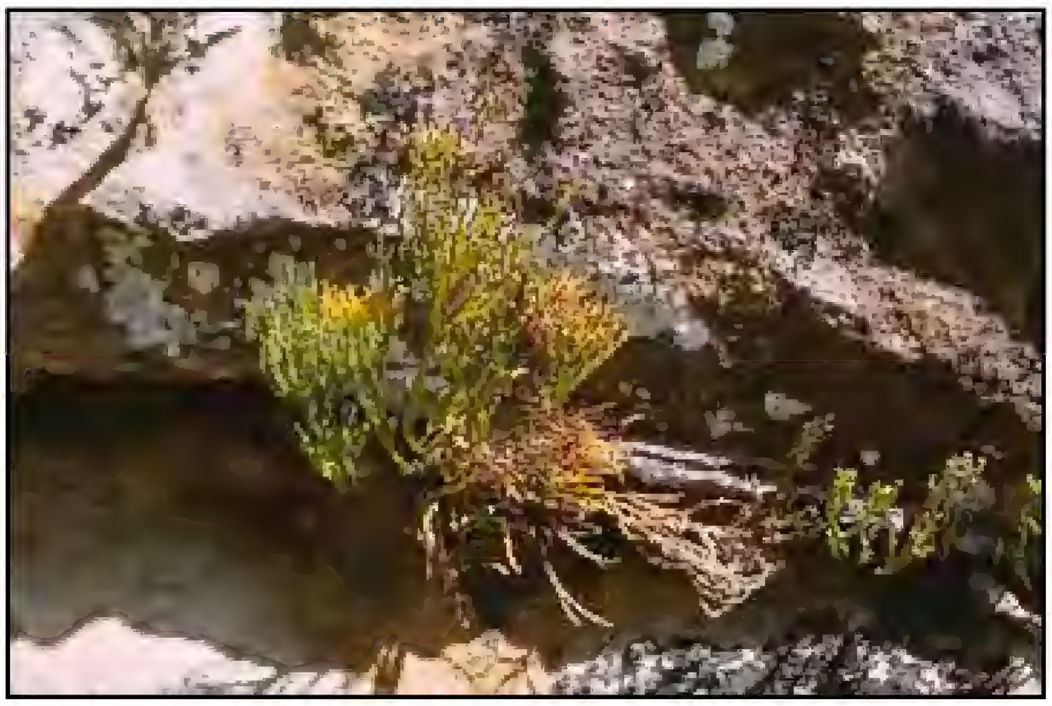
Fig. 5. *Psilotum nudum* at Devils Eye, the original site, showing signs of over exposure to the sun

When Betty died in 2002, her executors were at a loss over what to do with her books and papers. Since it was likely that they constituted an important archive, I offered to gather them together, sort them out and report on what was there. I collected about half a ton of paper in complete disorder, some eaten by silverfish and others damaged by water from the leaking roof of her newly-built retirement bungalow. Having assessed the archive, I reported to the executors; but this did not solve the problem of what to do with it. Eventually I bought the whole collection, and converted a room in my house in Spain to accommodate it.

I arranged the 1,500 letters in chronological order and indexed them by date, author and content. Each is now in a plastic slip and bound in ring folders, so is accessible to researchers. The letters and journals span the years 1947 to 2002 and cover much of botanical interest. There is almost nothing about her life in New Zealand. Some descriptions are outrageously scandalous, others contain pages of hand-written botanical descriptions which may well be unique. Many of Betty's reference books are tattered with much use but they contain valuable annotations and corrections from her field experience.

Fig. 6. Betty and David Bellamy, the naturalist and broadcaster, filming for the BBC about her discovery, April 1976
(photo: Geoffrey Allen)

On 13th September 2003, my wife and I invited 40 local people to drinks and *tapas* to view the now orderly collection and to publicise its availability to anyone interested. Benito Valdés and his wife made the journey from Seville. The little exhibition included some of Geoffrey Allen's journals, published photographs and original work on Far Eastern birds.

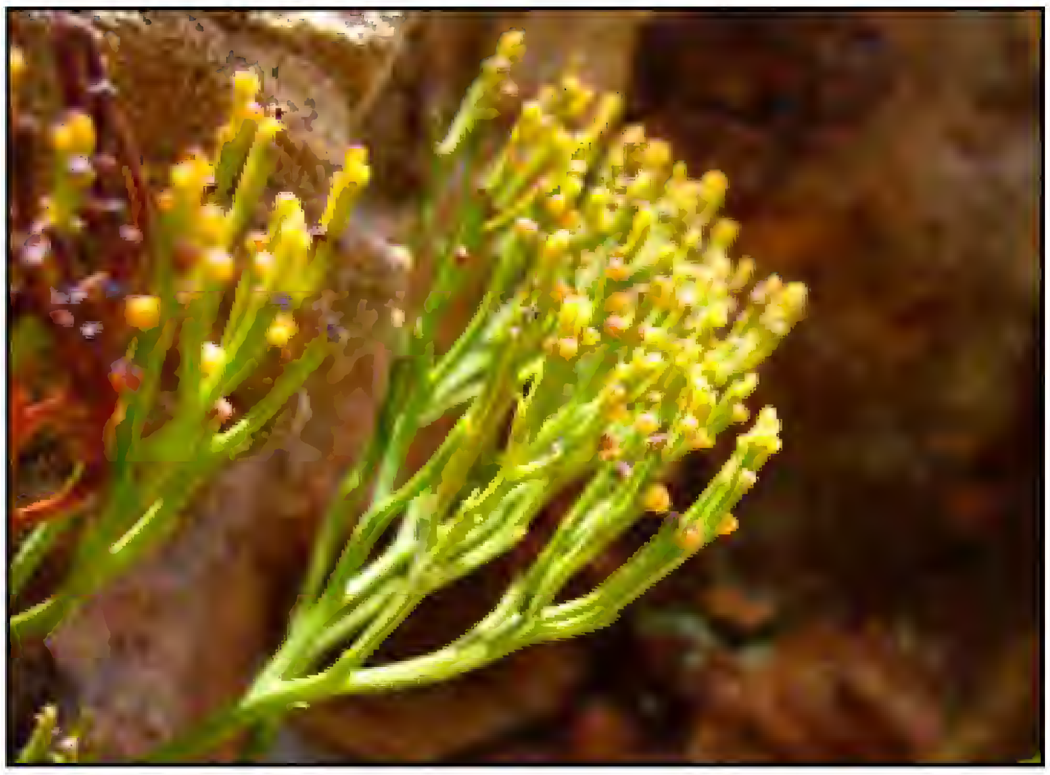
Fig. 7. *Psilotum nudum*, still surviving at Devil's Eye near Los Barrios

In October 2012 my wife and I began the long process of moving back to England. Since we could not accommodate Betty's archive in our small cottage, I considered giving it to Kew or The Linnean Society of London, neither of which showed much enthusiasm. Eventually the choice fell between the village of Los Barrios which had honoured Betty and named a garden after her, and Gibraltar Botanic Garden who, they told me, already had a room called *The Betty Allen Room*. In view of the fact that the archive was almost entirely in English, I decided on the latter. The director of the garden, Dr Keith Bensusan, took away the papers, specimens, journals and letters while I retained the books. In October 2014 I went to Gibraltar to photograph Betty's journal, I felt obliged to write the following email:

> 21st October 2014
>
> Dear Keith,
>
> I am somewhat disappointed that, after two years, Betty's archive is still not displayed in a way that makes it accessible to anyone wanting to work on it. You may remember that this, together with keeping the whole collection together, were conditions attached to my gift to the Gibraltar Botanic Garden. Having spent around £9,000 and many months of labour on preserving and conserving the archive, I feel justified in asking you to put the work in hand without further delay. Certainly the boxes must immediately be raised from the ground so that the risk of damage by flood is reduced. In view of the silverfish we saw in the journals box, the whole archive ought to be inspected for insect damage, and preventive measures taken.
>
> Having missed the opportunity for some sort of display to mark the centenary of Betty's birth last year, it would be good to recognise the 50th anniversary of her discovery of *Psilotum nudum*, which falls on 9th February next year. I am preparing an article for the British Pteridological Society to mark the occasion. The deadline is in mid December, and, in describing the history of the archive, I would like to be able to report that it is well displayed in Gibraltar. Two months is surely ample time for you to put up simple shelving, a table or two and lights.
>
> Yours sincerely,
> Martin.

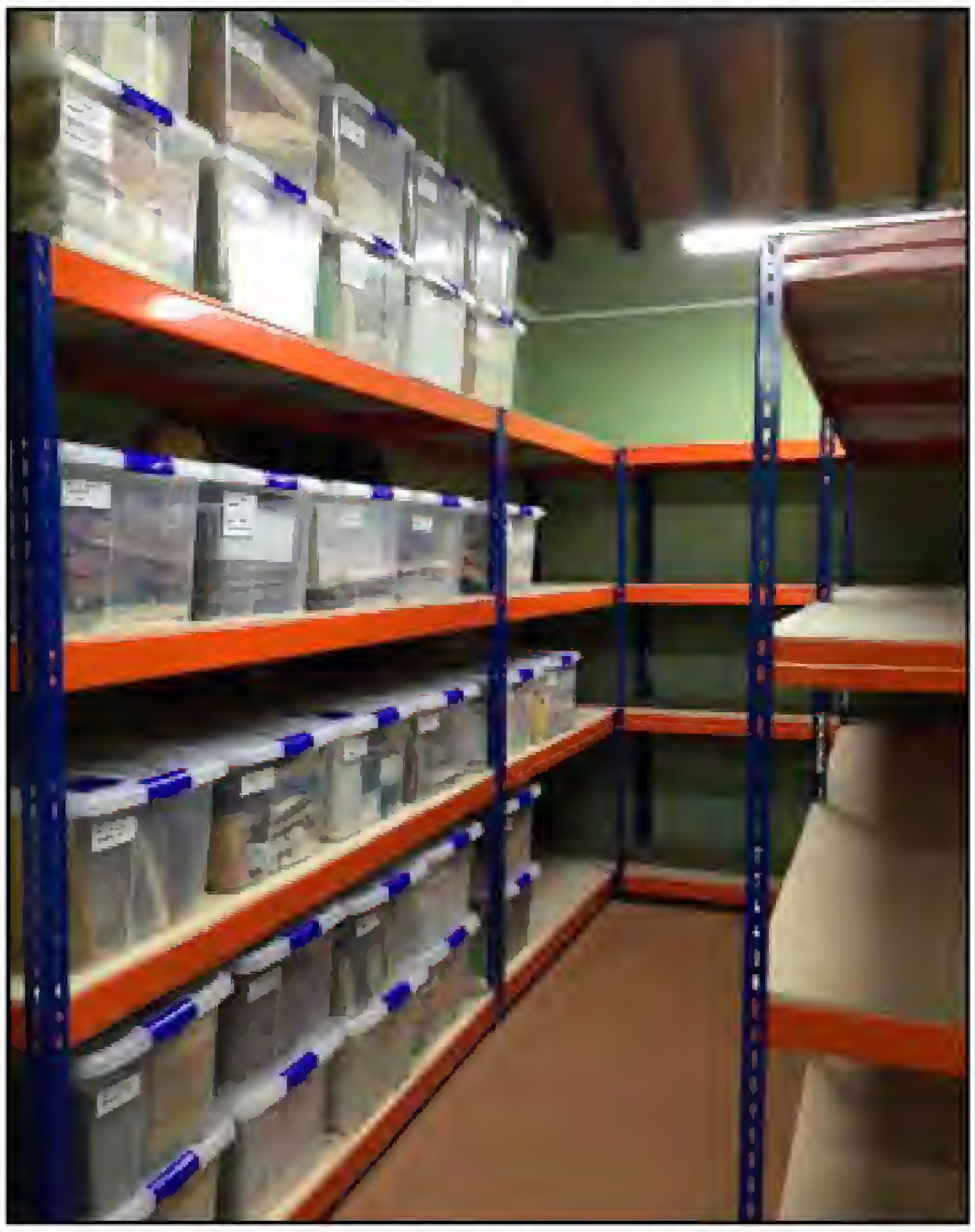

Fig. 8. The archive containing papers, specimens, journals and letters belonging to Betty, finally installed at the Gibralter Botanic Gardens

After further correspondence, in March Dr Bensusan sent me a photograph of the archive properly boxed and shelved (Fig.8). It is a truly fascinating collection of letters that cover much of English-speaking botany between 1947 and 2002, with special emphasis on ferns.

They are indexed by author, date and subject matter, and the index can be searched digitally. The journals cover a similar period, though they are not indexed. Anyone interested should contact the Gibraltar Botanic Garden directly at http://gibraltargardens.gi. They are also known as 'The Alameda'.

Since I am not a pteridologist, I have decided to disperse Betty's books among those who would appreciate them. Accordingly, I invite members of BPS to contact me directly for a list of titles. Having perused it, they could tell me if they are interested in any title, I would then describe its condition and send photographs. They could then make me an offer. ❐

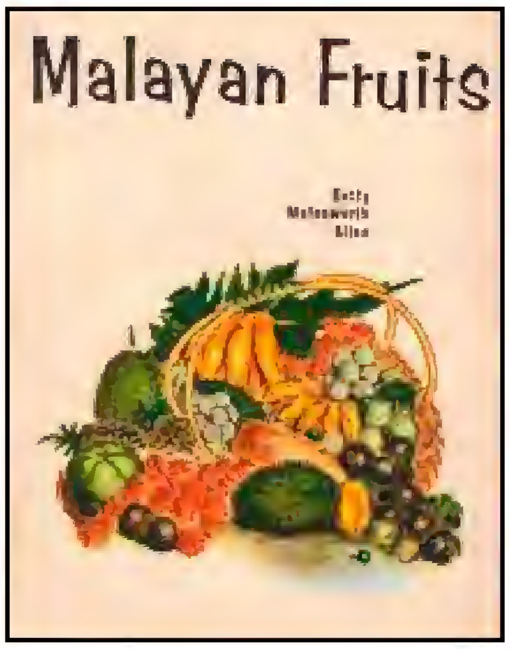

Fig. 9. 'Malayan Fruits' written by Betty and published in 1967

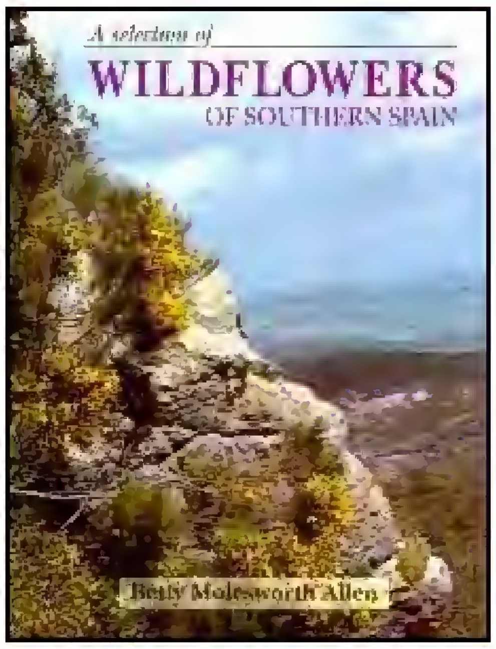

Fig. 10. 'Wildflowers of Southern Spain' written by Betty and published in 1993

(Endnotes)

1 I have lightly edited Betty's shorthand by completing words and expanding her '/' to 'the' etc., but left out the customary and distracting editor's parentheses, though significant additions are in brackets.

2 a striking rock formation. The exact location can be discovered though I have decided not to give it here.

3 parentheses added in pencil later.

4 the border between Gibraltar and Spain was shut so visitors had to take the ferry to Morocco and then back to Spain.

5 *Peripatus* is a 'living fossil', that appears intermediate between sea-worms and centipedes. It is confined to land that once formed the ancient continent of Gondwana.

6 Holttum does not italicise by underlining certain words in his letter so I have done so for clarity.

7 In August, Betty and Geoffrey joined the Pteridological Society in Austria, including Holttum (see Journal 14 pp 1686).

8 I can find no entry for *Psilotum* in her journal before 9th February.

9 The double quote-marks are clear in Betty's manuscript and signal inches. The only specimens of *Psilotum* I have seen are seldom more than 20 centimetres long. I wonder if she is confusing units. It would be worth checking against the original specimens at Kew.

10 I take this single quote-mark to mean feet.

Rust fungi on ferns

Paul Smith

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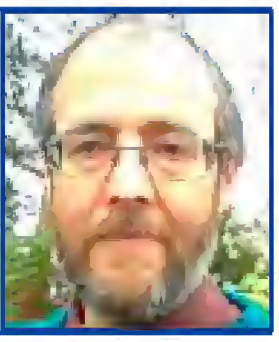

Summary

Rust fungi quite often parasitise species of fern, though they can be inconspicuous and are often overlooked. This article gives an overview of the species known from Britain and what they look like, and seeks to encourage recorders to look out for them while looking at ferns.

Introduction

Fern fronds contain a mixture of sugars, proteins and other valuable nutrients, and, although they are protected by a waxy cuticle and assorted chemical defences while they are alive, a number of groups of fungi and animals parasitise them, and a larger number of fungi use dead fronds as a substrate. One group of obligately parasitic fungi found on ferns is the rust fungi. Rusts have a very specialised lifestyle with up to five spore stages spread across possibly two different hosts, and are more closely related to mushrooms and toadstools than to most other types of microfungi[1]. Rusts occur on many plant species, and their common name comes from the generally brown or yellow spores. There are several species which parasitise British ferns, though most of these have colourless spores (under a microscope), which look white when seen in a mass on a fern leaf.

The different spore stages of rusts have names, but are also referred to by roman numerals (see Fig. 1). Most fern rusts are the diploid stages, represented by spore types II and III (uredinia and telia respectively). The IIIs produce a short-lived basidiospore stage (IV), which is rarely seen unless special steps are taken to germinate the IIIs, and these infect the alternate hosts, which for most fern rusts are conifers. Spore stages 0 and I (spermogonia and aecia) are formed on the coniferous host, and the Is infect the fern host again and produce a new generation of IIs. It has often been considered that fern/conifer rusts are evolutionarily primitive, but there is an alternative hypothesis that tropical rusts are the most primitive (Termorshuizen & Swertz 2011, p25).

Although these five spore types represent the full cycle of spore stages ("macrocyclic"), some rusts have some of these stages missing ("microcyclic"), and even where the full cycle is present some species may persist in a single stage (normally IIs) with the same spores reinfecting new hosts. So it is often possible to find rusts on ferns long distances from the nearest specimen of the alternate host.

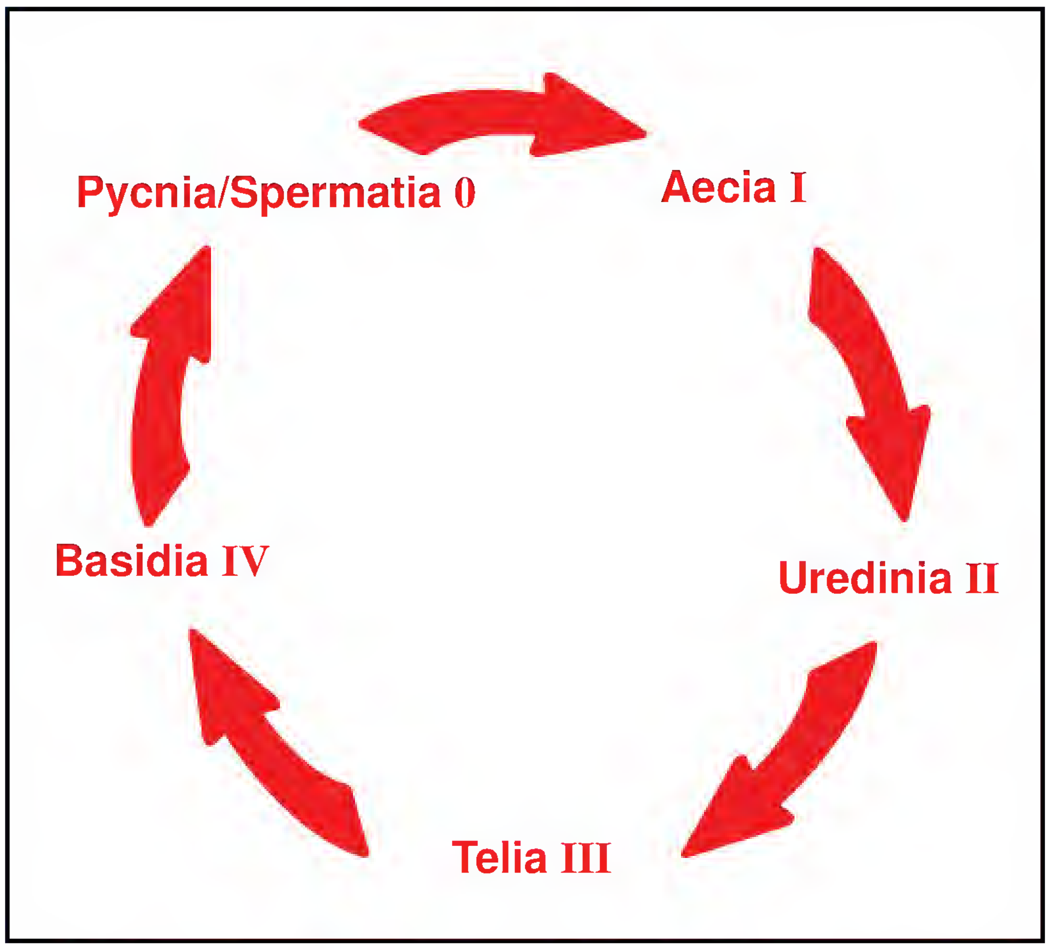

Fig. 1. Diagram of the spore stages in the life cycle of a rust fungus. Rusts on ferns may persist as IIs, reinfecting the same host species, rather than going round the whole cycle

Rusts on ferns

Table 1, below, shows which rusts are found on which host species. Most rusts on ferns in Britain belong to the genus *Milesina*, which is relatively inconspicuous, though the IIs can be abundant and then show as white powdery spores coming from little volcanoes on the underside of fronds (the spores are said to be *erumpent*).

Fern species	Rust species and spore stages	Alternate host(s)	Number of records in FRDBI (Red list status)
Adiantum capillus-veneris	*Hyalopsora adianti-capilli-veneris* II (III known outside British Isles)	unknown	1 (vulnerable)
Asplenium adiantum-nigrum	*Milesia magnusiana* II	unknown	2 (Ireland only)
Asplenium ruta-muraria	*Milesina murariae* II (III recorded from Switzerland)	unknown	21
Asplenium scolopendrium	*Milesina scolopendrii* II, III	*Abies alba*	336
Blechnum spicant	*Milesina blechni* II, III	*Abies alba*, *Abies cephalonica*	243
Cystopteris fragilis	*Hyalopsora polypodii* II, III	unknown	40
Dryopteris aemula, D. affinis s.l., *D. dilatata, D. expansa, D. filix-mas*	*Milesina kriegeriana* II,III	*Abies alba, A.cephalonica, A. grandis, A.nordmanniana*	500
Dryopteris filix-mas	*Milesina carpatorum* II,III	unknown	31(vulnerable)
Gymnocarpium dryopteris	*Hyalopsora aspidiotus* II, III	*Abies alba*	3 (extinct 1845)
Phegopteris connectilis	*Uredinopsis filicina* II,III	probably *Abies alba*	1 (extinct 1936)
Polypodium spp.	*Milesina dieteliana* II, III	*Abies alba*	217
Polystichum setiferum, *P. aculeatum*	*Milesina whitei* II, III	unknown	96
	Milesina vogesiaca II, III	(*Abies alba* by inoculation)	7 (vulnerable)

Table 1. Fern hosts of rust in Britain. (Unofficial red list information from www.fieldmycology.net/Download/RDL_of_Threatened_British_Fungi.pdf)

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[1] To use the technical terms, rusts are basidiomycetes, whereas most moulds and other smaller fungi are ascomycetes.

The fungal infection on a fern originates from a spore, either a I (aeciospore) landing from an alternate host, or a II (urediniospore) originating from a fern (either the same individual being reinfected or spreading from another individual). The spore germinates, and forms a hypha which penetrates the fern cuticle (often through a stoma). It gathers its nutrients directly from the host's cells, and the infection spreads. The spores are formed in pustules, which are generally all there is to be seen of the rust. Urediniospores of *Milesina* are colourless under the microscope, usually with scattered spines (*echinulate*; Fig. 6) (many other rusts have either more densely-spined or smooth urediniospores).

The III spores are generally the overwintering stage of rusts, and in *Milesina* they are intracellular, formed within the cells of the epidermis (Fig. 8). They form brown areas on fronds, but are not erumpent like IIs, and are only liberated by decay of the frond. It usually requires careful examination of excised pieces of the epidermis under the microscope to locate them.

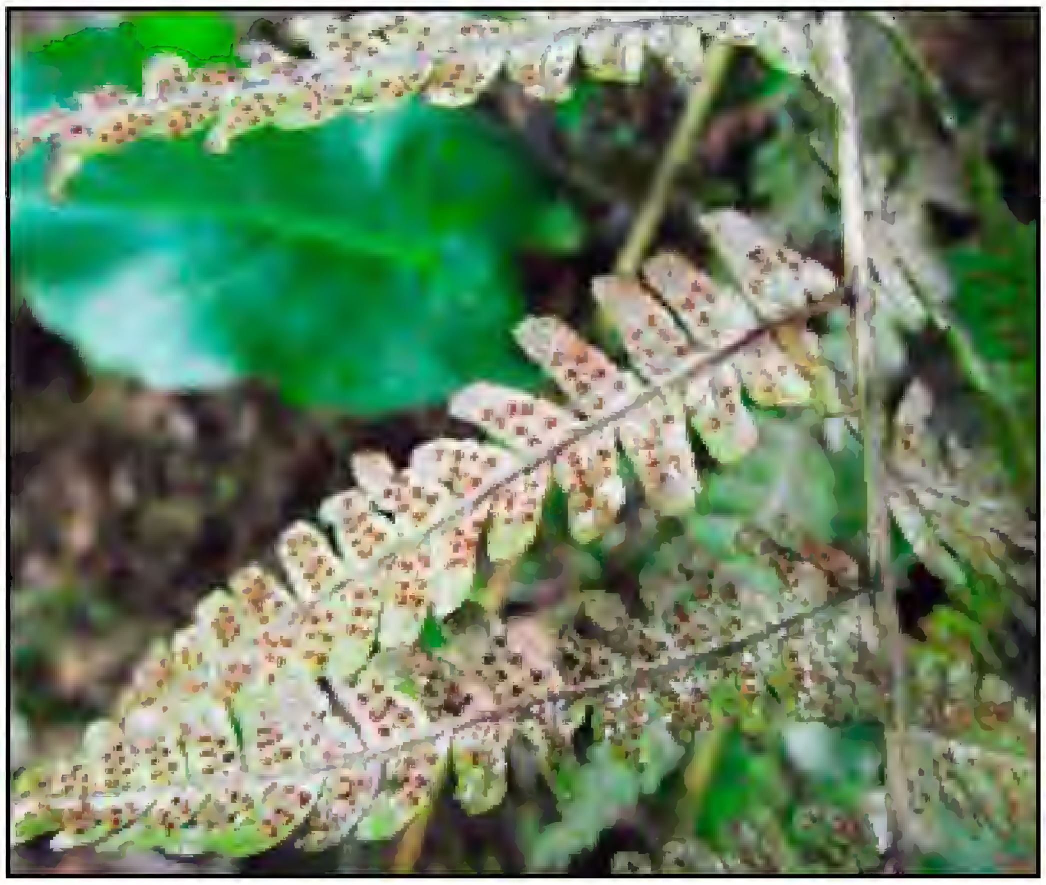

Fig. 2. *Milesina kriegeriana* II on *Dryopteris affinis* from Coed Clwyd-gwyn, ST1472, vc41

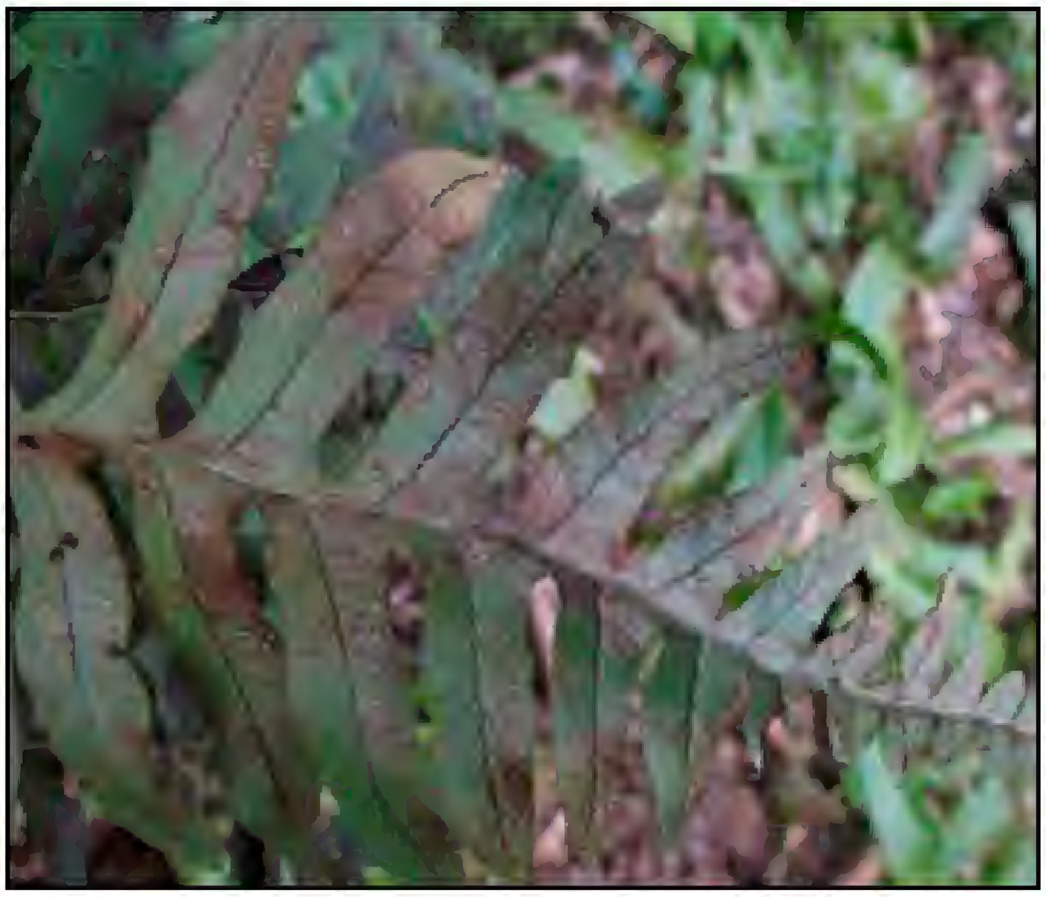

Fig. 3. *Milesina dieteliana* II on *Polypodium interjectum* from Coed Clwyd-gwyn, ST1472, vc41

Although *Milesina* species are rather inconspicuous, the rust *Hyalopsora polypodii*, which parasitises *Cystopteris fragilis,* has IIs which are a much more characteristic (for rusts) orange colour (Fig. 5). It is an uncommon rust, but may well be under-recorded. Keep an eye open for it in upland areas.

Because they often grow on dying or dead fronds, fern rusts are especially findable in winter and so give the pteridologist an excuse for fieldwork in an otherwise slack season

How do I identify a fern rust?

Naming the host species is usually the best start, as most rusts are very host-specific (there are interesting and unresolved questions about what happens with some hybrids, though…). It's important to look at some spores from your specimen under a microscope to confirm your record – there are many things which look superficially like rusts (notably some other fungi), and it's easy to record in error otherwise. Spores of other fungi are not usually echinulate and not erumpent (but beware *Ramularia* spp. which can have clusters of spores emerging from the stomata).

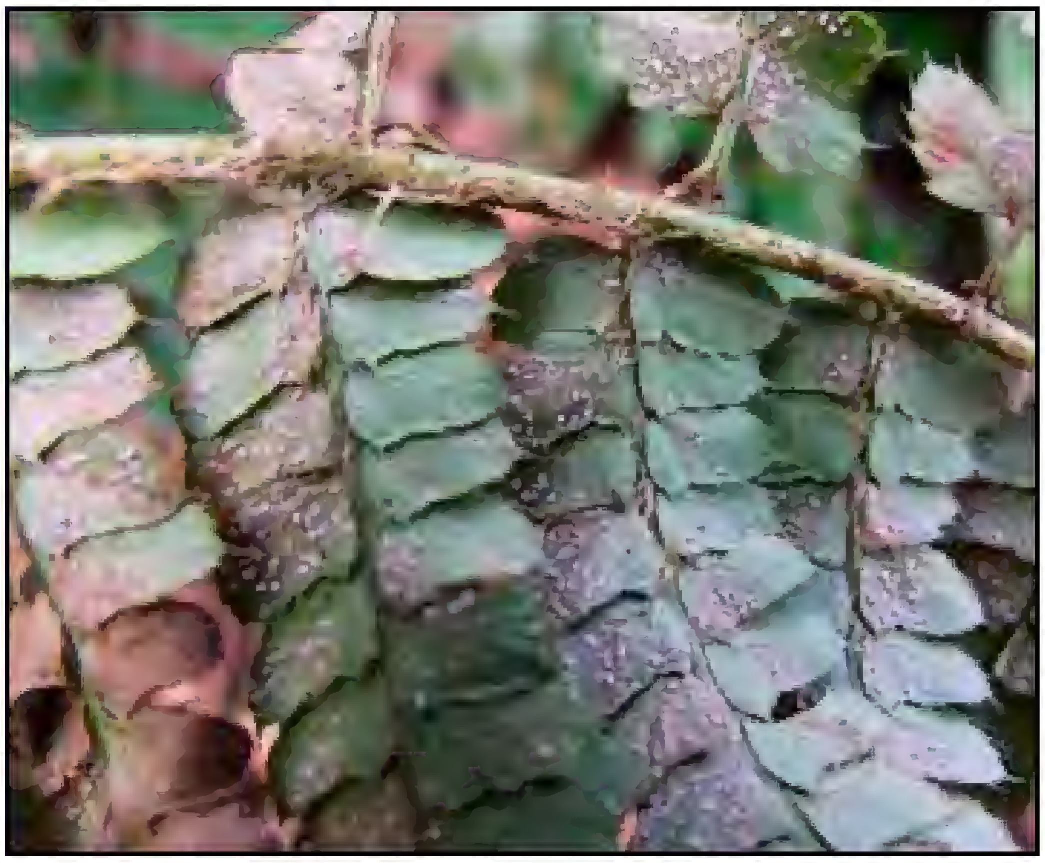

Fig. 4. *Milesina whitei* II on *Polystichum setiferum* from Coed Clwyd-gwyn, ST1472, vc41

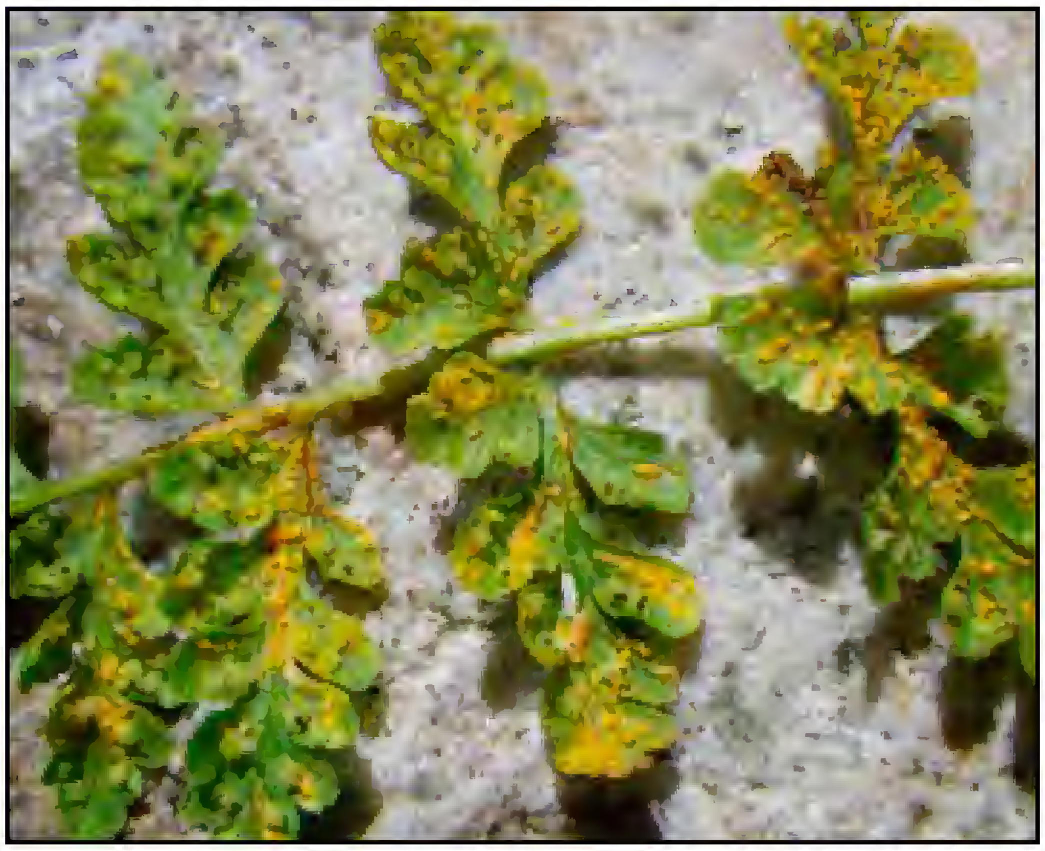

Fig. 5. *Hyalopsora polypodii* II on *Cystopteris fragilis* from mortar of a ruined farmhouse, nr Cwm Twrch, NE Carmarthenshire, vc44
(Photo: © R.N. Stringer)

For the few cases in Table 1 where there are two species on the same host, I give short keys below, summarised from Henderson (2004).

On *Dryopteris*:

II spores subglobose, 14-17 × 11-17 µm	*Milesina carpatorum*
II spores ellipsoid, 23-48 × 15-22 µm	*Milesina kriegeriana*

On *Polystichum*:

II spores smooth	*Milesina vogesiaca*
II spores echinulate	*Milesina whitei*

There is a booklet of summary keys for identifying rusts (Henderson 2004) which is out of print but available to download from www.aber.ac.uk/waxcap/downloads/Henderson2004-BritishRustFungiHostPlantGuide.pdf. For more details you could look at Ellis and Ellis (1997) which covers microfungi (not just rusts) on land plants. For rusts in more detail, Wilson & Henderson (1966) was reprinted in 2011 and so is generally available and not reliant on second-hand copies. Termorshuizen & Swertz (2011) has good descriptions and illustrations of the spores.

One or two rusts have also been recorded on imported ferns (Henderson [2004] reports one, *Uredinopsis americana*, on *Onoclea sensibilis*, for example), and these are likely to be harder to identify, since many more rusts species are known on ferns outside the British Isles (Index fungorum, www.indexfungorum.org, shows 63 species of *Milesina* and 31 of *Uredinopsis*, for example).

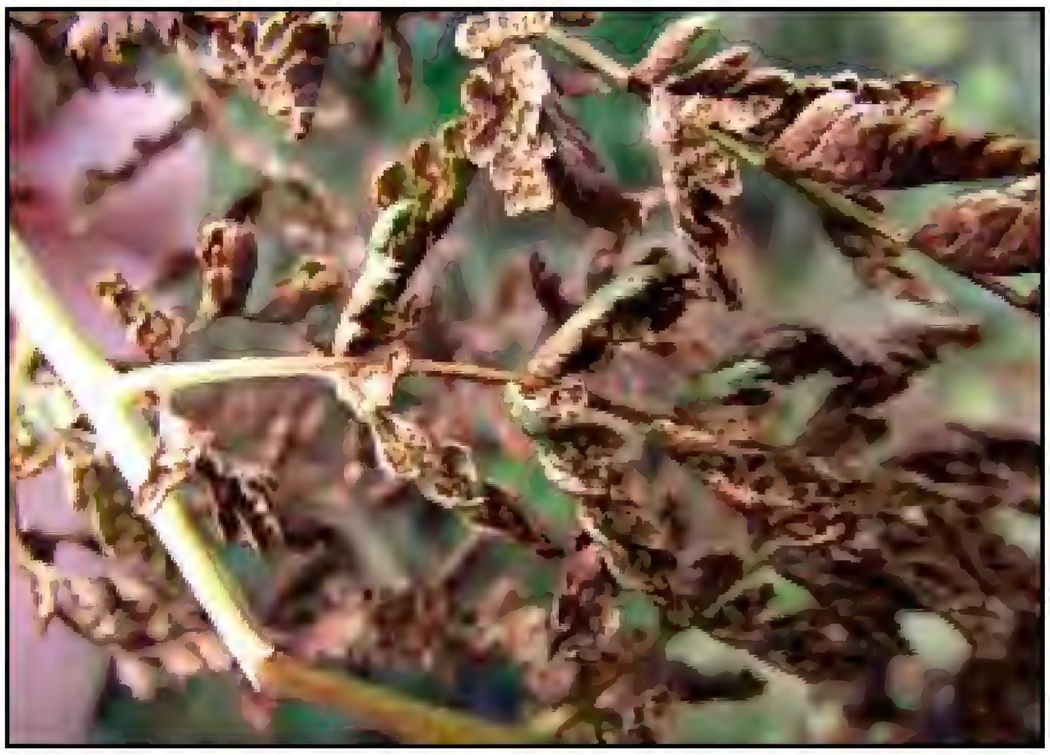

Fig. 7. Brown patches like these on the pinnules are where IIIs form in the epidermal cells (*Milesina kriegeriana* on *Dryopteris dilatata*, Lacasdail, Stornoway, vc110, NB427345, 28 April 2014)

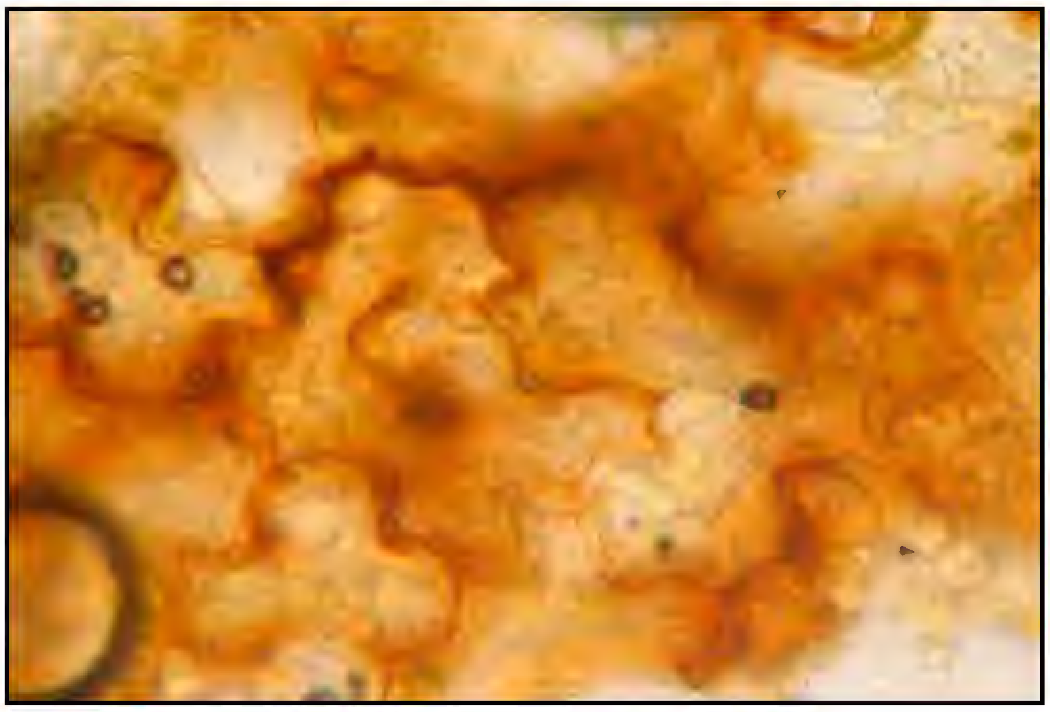

Fig. 8. Telia (IIIs) of *Milesina scolopendrii* (the faint walls) within large, multilobed epidermal cells of *Asplenium scolopendrium*, SK58, vc63

(Photo: ©Malcolm Storey www.bioimages.org.uk)

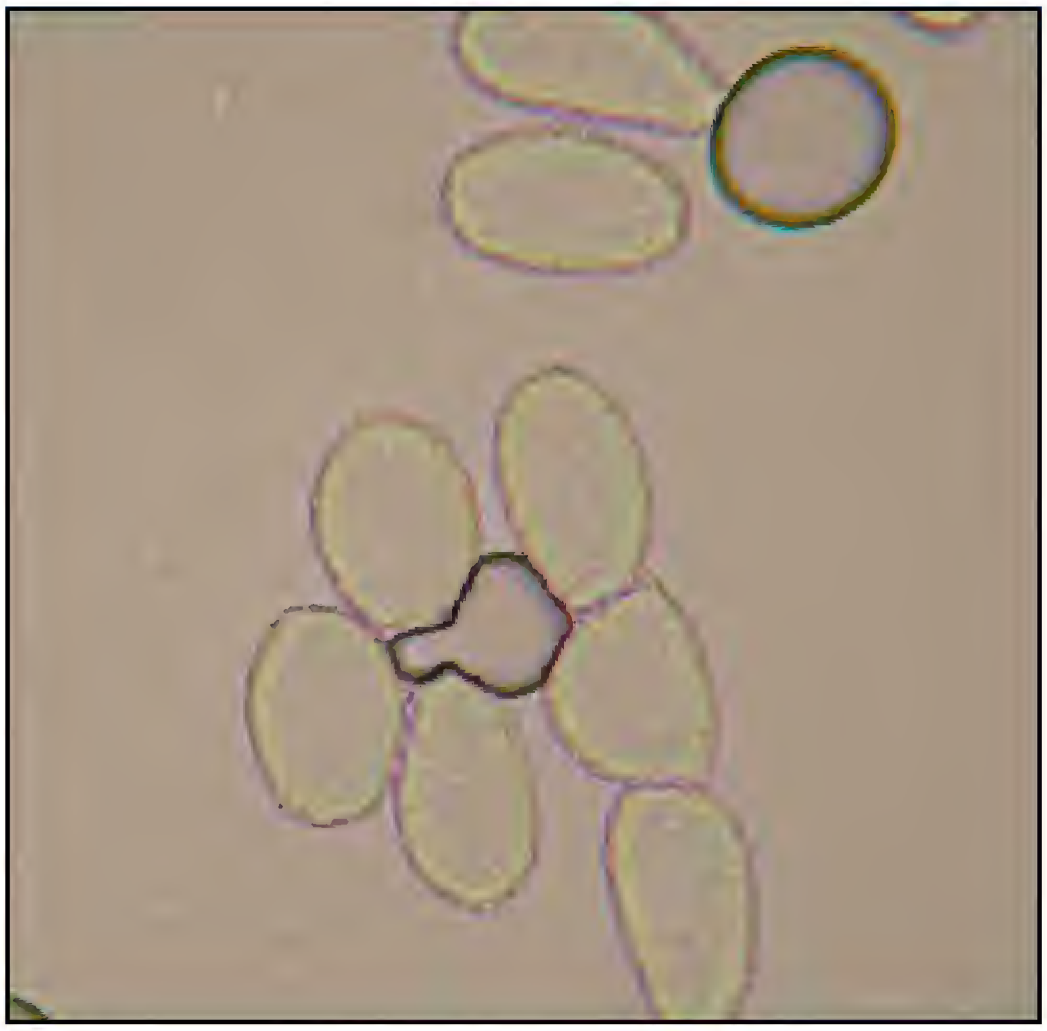

Fig. 6. Urediniospores (IIs) of *Milesina dieteliana* on *Polypodium vulgare* s.s., Caslub, S. Uist, NF84, vc110

Distribution of fern rusts

Fern rusts follow their host species fairly closely; in a few cases the rusts are much rarer than their hosts. There is a general tendency for rusts to be found where humidity assists the germinating spores, and where the host plants are stressed (often on dry soils), but it would be worth looking anywhere where the appropriate hosts are found. The Fungal Records Database of the British Isles (FRDBI, www.fieldmycology.net) shows where they have been recorded, but as so often with smaller and less cuddly organisms, there is certainly a considerable amount of under-recording.

When you make records, the best thing to do in general is to send them to your local county or district fungus group (you can find their contact details at http://www.britmycolsoc.org.uk/ mycology/recording-network/groups/). For the 2015-16 season, I would be happy to have a small project to see what rusts BPS members can record, so please email me your records of rusts on ferns, by June 2016. You're welcome to contact me for assistance with identifying rusts on ferns. If there are sufficient interesting records, I'll write a follow-up article.

So, do keep an eye open for rusts as you look at ferns – and if you want a real challenge, find the rare or locally extinct ones on *Phegopteris connectilis*, *Asplenium adiantum-nigrum*, or *Gymnocarpium dryopteris*. ❐

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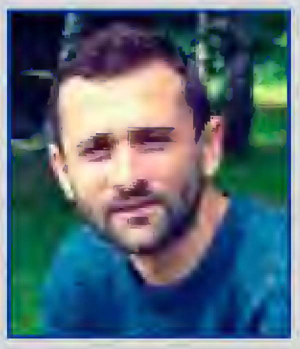
An artist and her ferns



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I first came across Helen's work on Instagram, the photo-sharing app so popular nowadays (see page 172). As manager for the society's Instagram account I am always on the lookout for people who share their love of ferns online.

Over the years this magazine has featured various ways in which ferns were used to decorate objects, mostly in Victorian times. Here is an interview with an artist who has a fresh approach on making art with ferns.

A name on instagram: helenahpornsiri. Who is the artist behind this online id?

This one has quite a simple answer, it looks a bit like some jumbled up letters but its my name, Helen Marie Ahpornsiri. Not much of an online alias I'm afraid! I was born in East Sussex and I returned to my home county after a degree in Illustration at University College Falmouth.

Why ferns? What draws you to them? Is there a story behind?

Ferns seem so modest, their lack of flowers means they are likely to be overlooked in favour of something more colourful or bold. You can see a rare fern in a carefully constructed terranium or you might see one growing in a drain with just the right conditions. The history and folklore of ferns sparks the imagination too, from tales of invisibility cloaks and magic keys, to the Victorians using fern collecting to aid in curing depression.

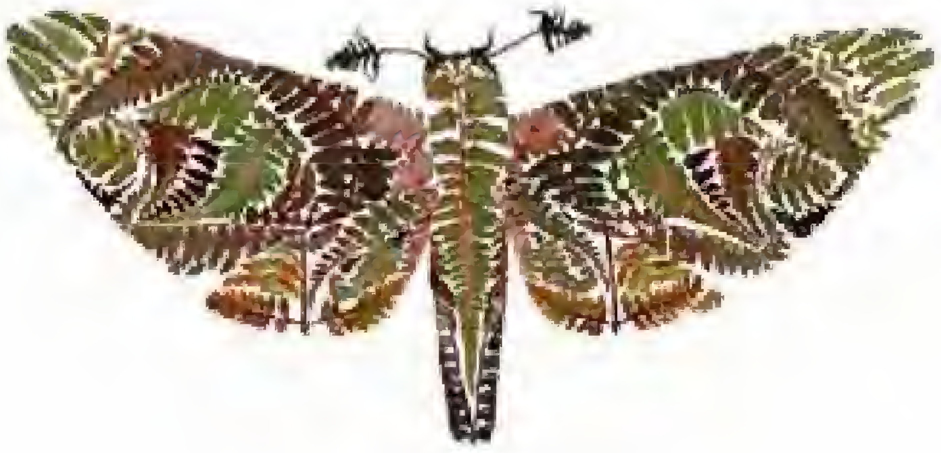

Fig. 1. The Ghost Moth (*Hepialus humuli*) made from pressed ferns. (The Ghost Moth gets its name from the display flight of the male, which hovers, sometimes slowly rising and falling, over open ground to attract females - ed.)
© Helen Ahpornsiri

Do you grow any ferns, do you garden? Where do you collect the fronds you use?

About half of the ferns I use in my artworks I grow myself. However, I am far from being an accomplished gardener and don't grow half as many as I dream of.

The charming thing about using ferns is they grow almost everywhere, so I am constantly on the lookout. I carry a sketchbook with me everywhere so I can store fronds wherever I am, then press them properly when I return home. I often raid the gardens of friends and family, I find bracken on roadsides, old walls are great for small delicate fronds and of course woodlands and streams. Strong consideration goes through my mind, in terms of the immediate ecosystem, before I ever pick something in the wild. I don't want to disturb the order of things.

Most of the ferns I grow are the more colourful varieties with young reddish fronds. I also collect a lot in the autumn as the bracken turns a lovely golden yellow. This helps keep the pictures bright and not completely green, even though there are so many shades of green too.

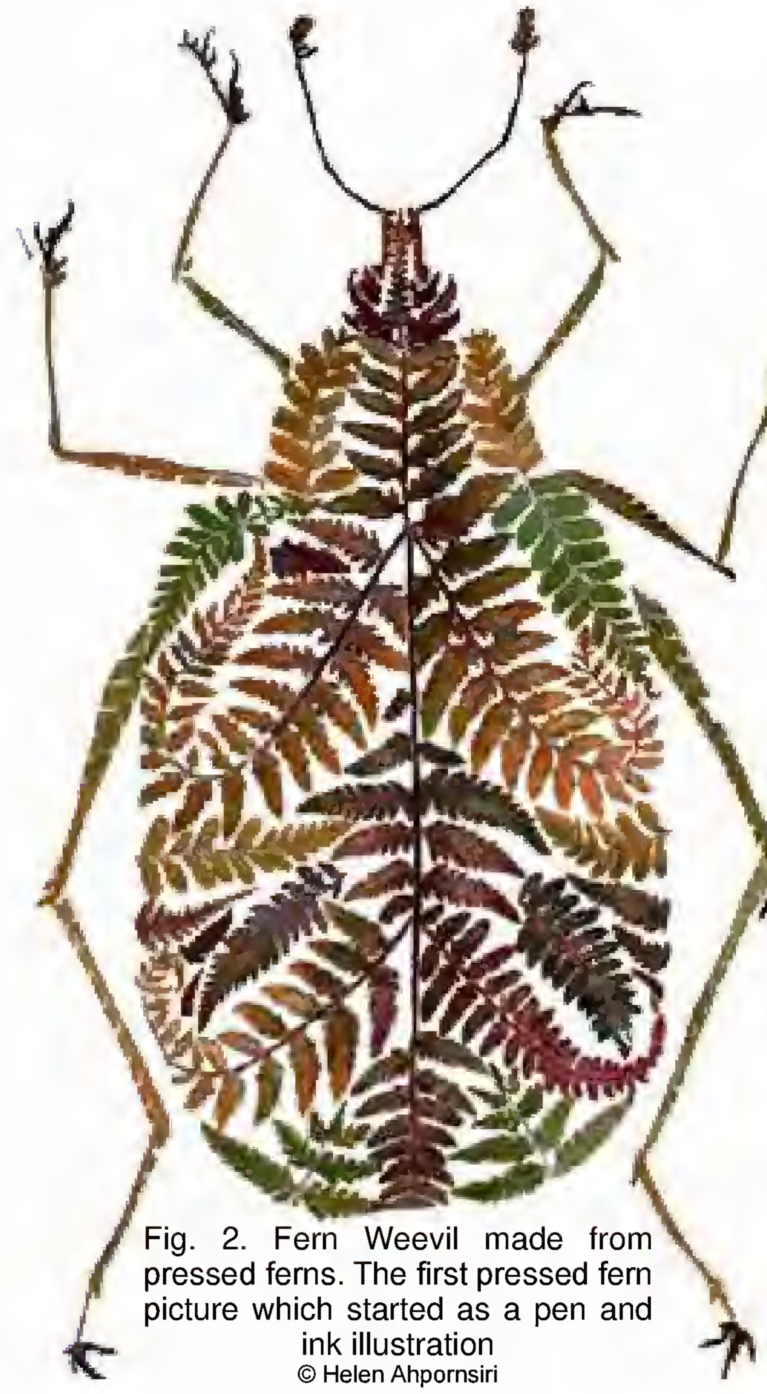

Fig. 2. Fern Weevil made from pressed ferns. The first pressed fern picture which started as a pen and ink illustration
© Helen Ahpornsiri

How/when did you start collecting? What made you use ferns in your art?

The fern that I first used in my pictures was a Japanese Painted fern, which is in my parents garden. The variety of colours drew me to it and I began pressing the leaves without knowing what I wanted to do with them. I just knew I needed to preserve them.

The pressed fern pictures actually started with an ink illustration I drew of a Fern Weevil from a little personal series. After drawing it, I decided to try making a version with the fern leaves I had previously pressed. Then I began collecting and researching ferns. I read about myths, the different species and the Victorian craze. Originally I planned on pressing other types of plants to use in art work but Pteridomania prevailed.

Birds, beetles, butterflies, mushrooms, ferns — you are obviously a lover of nature, aren't you?

You can go back to the same woodlands or beaches over and over again and it will always be different. Nature is endlessly inspiring to me and it is always humbling to be around.

An artist and her ferns.

How do you build your identity as an artist? How important is that identity for you?

In terms of identity as an artist I'm still finding my feet, I probably always will be. Attention to detail is the main consistency in my artwork, but I would hate to be constrained to always work in a particular way, I want to try everything. As long as I am working to the best of my ability I feel identity is secondary.

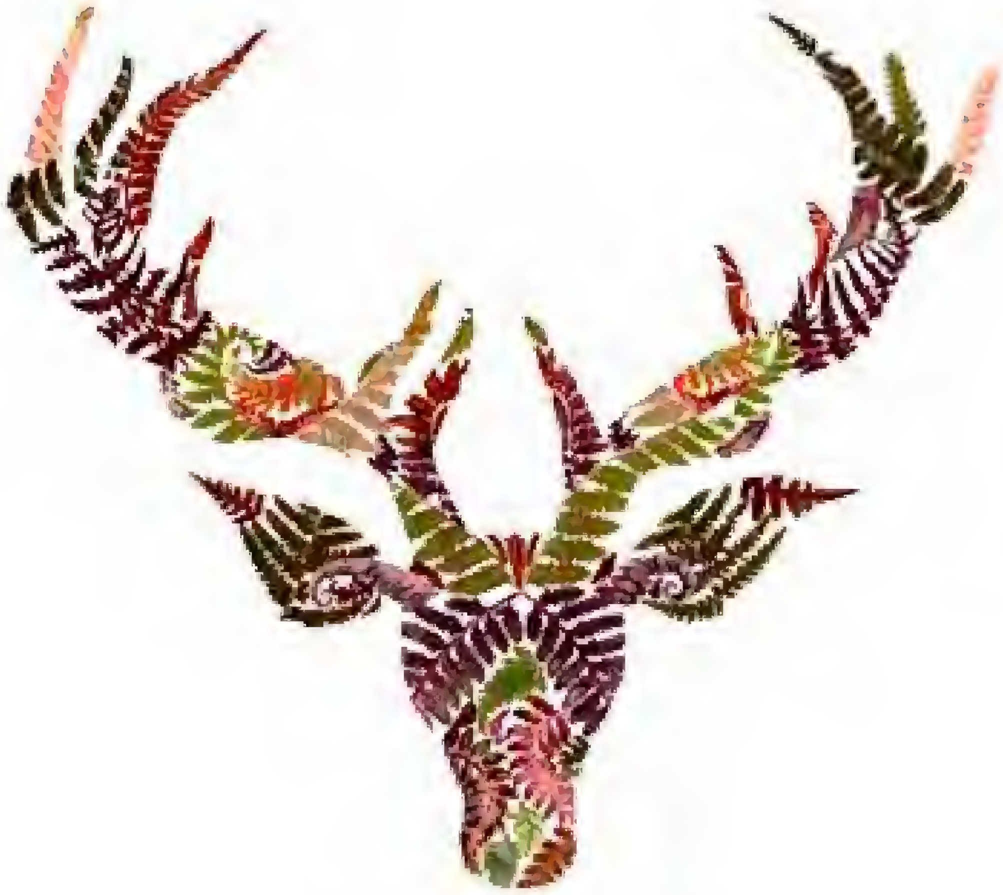

Fig. 3. A stag head, one of Helen's first more experimental works with fern fronds
© Helen Ahpornsiri

What is your biggest challenge as an artist?

Part of creating anything is about approaching challenges in unique ways, but time is my greatest hindrance. Between pressing a fern, using it in an artwork and editing, months can pass by and I might still be working on the same piece.

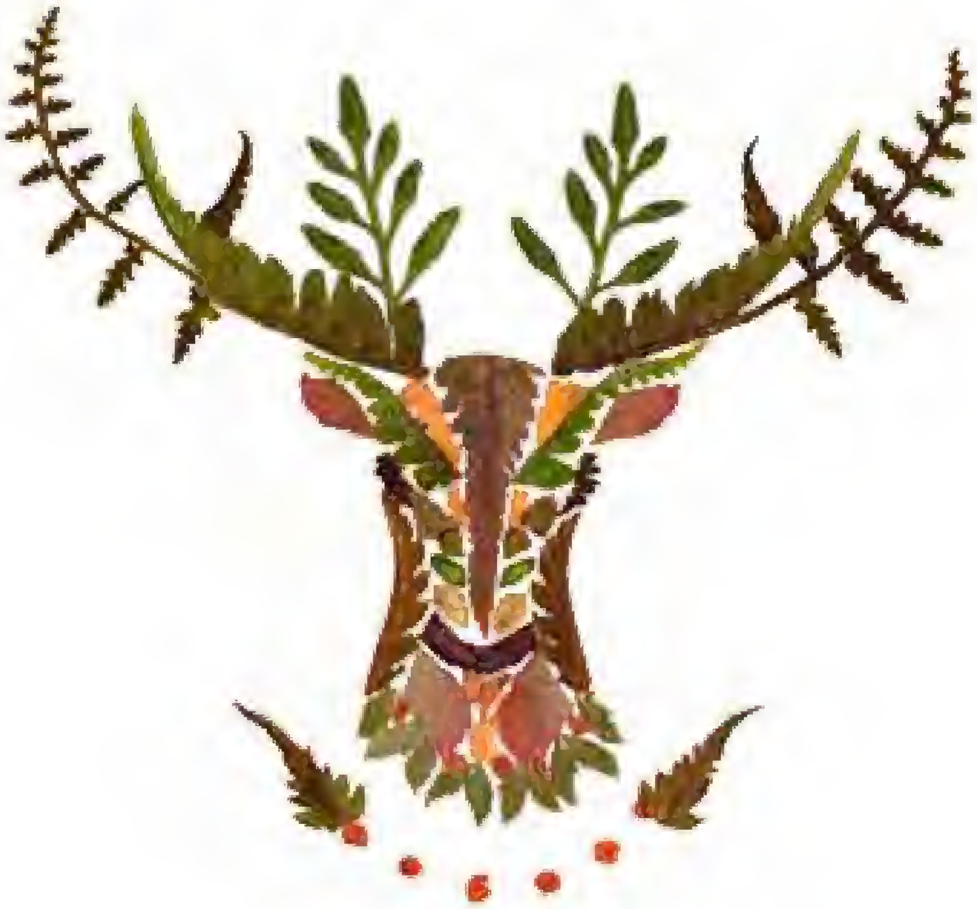

Fig. 4. Miniature second version of the stag head measuring just 5 cm square. Made using only the tips of the fronds
© Helen Ahpornsiri

Can you talk us through the process that goes into making a fern collage?

There are a number of flower presses around my home that are almost always full. I try to leave the ferns inside the press for as long as possible. It can often take around four or five months between picking a frond and using it in a picture, and it's always quite exciting to open the press and see pieces I've forgotten about inside.

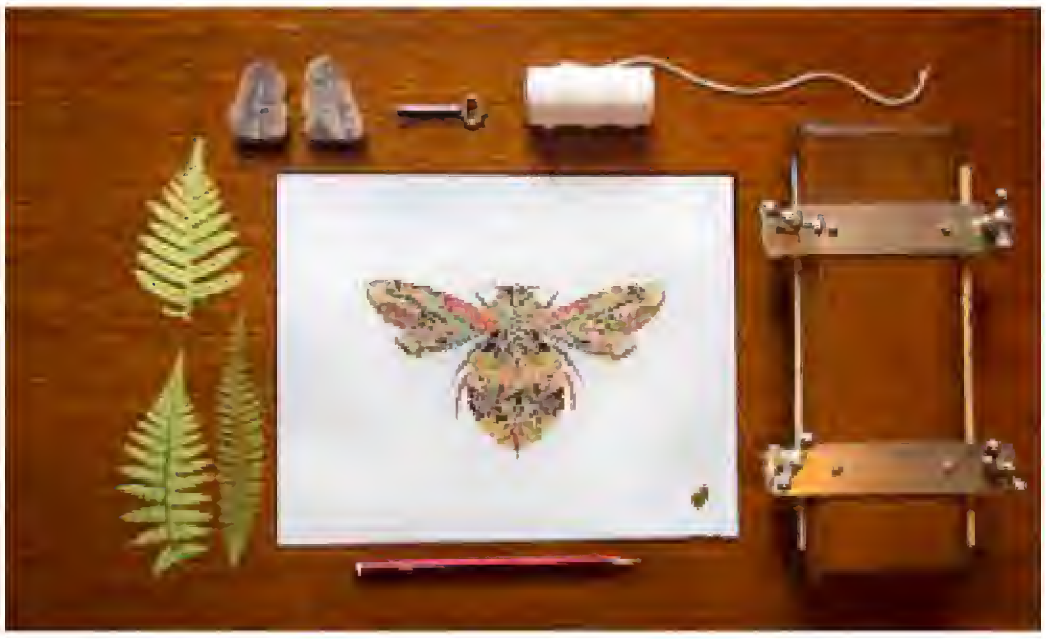

Fig. 5. The original pieces will eventually fade and so prints are produced. This one is a Honey Bee displayed for sale on Helen's online Etsy store
© Helen Ahpornsiri

I organise all the pressed ferns in trays, books and photo albums to keep them flat and safe as they are so fragile. When starting a picture I sketch the outlines of my design and then go through the pressed ferns and pull out any that I think will be appropriate. I like to use symmetry in my pictures so I pick out any pair of identical looking fronds while trying to get a range of different species and colours.

Then we get to the cutting and glueing. I use two knives when working, one to cut and move the pieces of ferns around, and another to apply the glue. The patterns I make with the fronds are a kind of three part negotiation: the shape the fern will be forming, the patterns I want to construct and the natural curves of the ferns themselves all

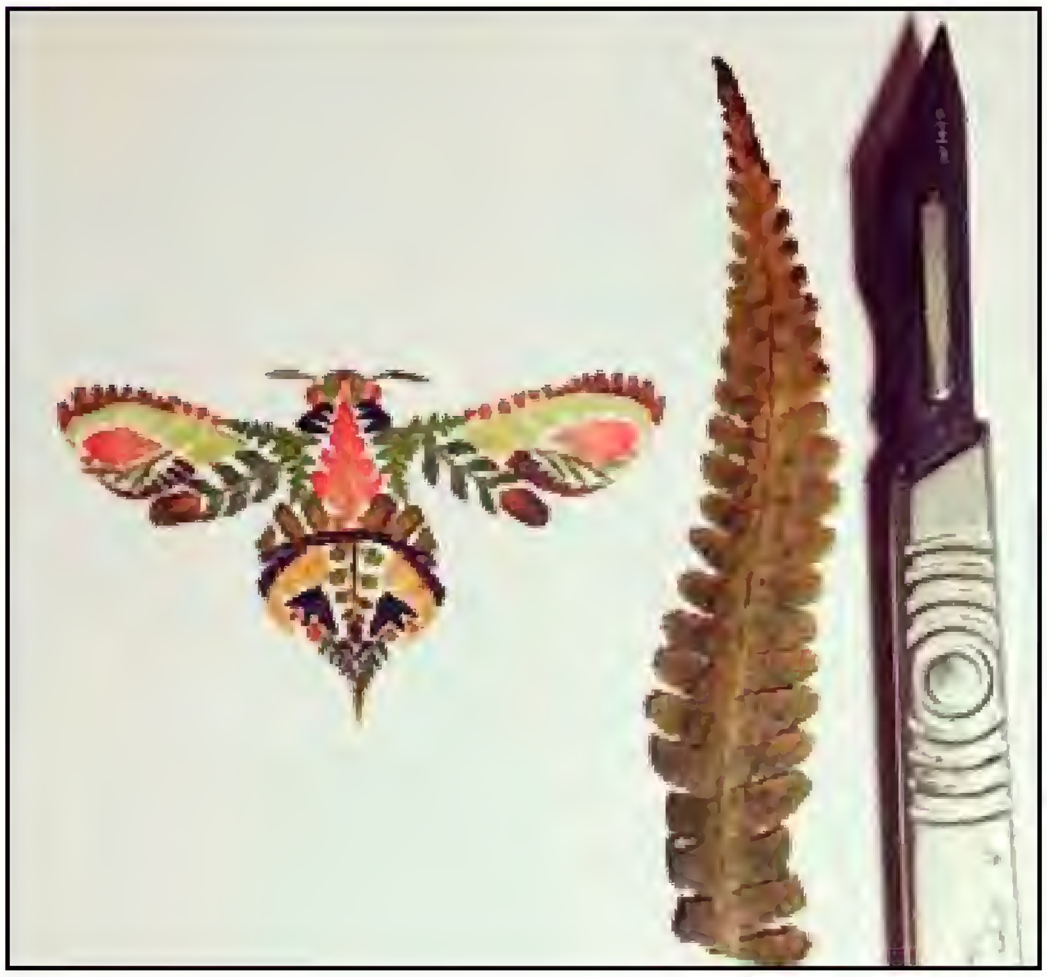

Fig. 6. A miniature bee displayed with objects for scale, it measures roughly 3 x 5 cm.
© Helen Ahpornsiri

An artist and her ferns.

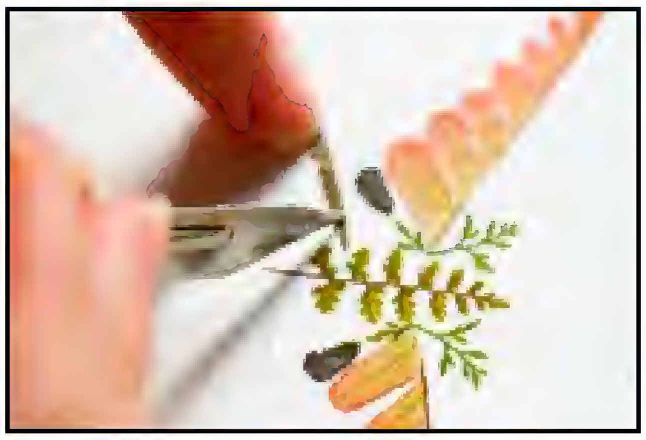

Fig. 7. For more detailed patterns fronds are often cut in half or the pinnae are separated
© Helen Ahpornsiri

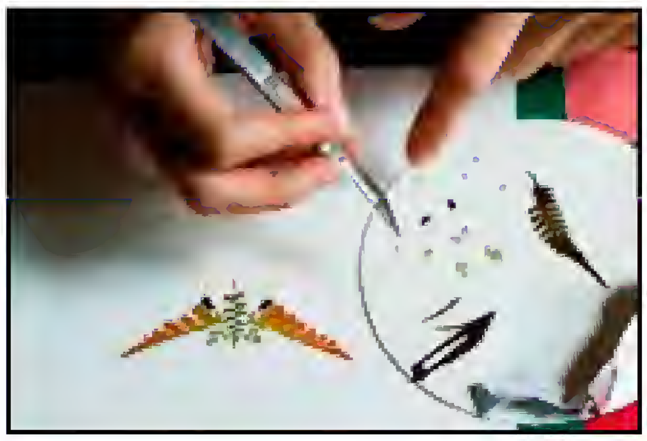

Fig. 8. To select the right piece of fern the artist needs to consider shape, colour and size
© Helen Ahpornsiri

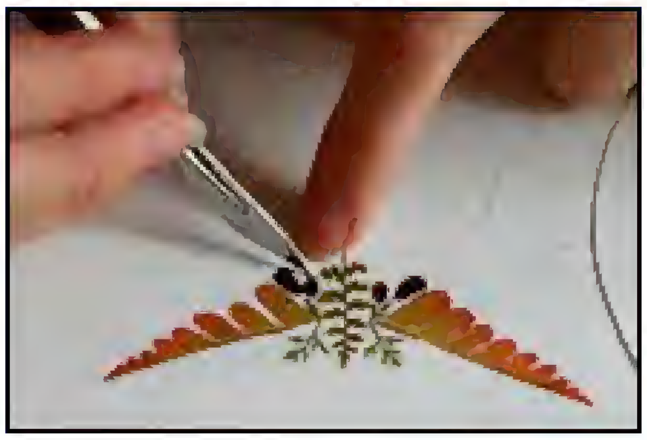

Fig. 9. A surgical knife is used to position the fern with absolute precision
© Helen Ahpornsiri

contribute evenly. Through this I hope to create images that are both structured and flowing. It is a slow process but I find it both peaceful and rewarding.

Fig. 10. The artist, Helen Ahpornsiri, hard at work in her studio, putting the finishing touches to one of her pressed fern pictures
© Helen Ahpornsiri

What about a portrait?

As for doing portraits of people with ferns I've never really considered it! I've already designed my next set of fern pieces in which I'll be moving back a little from natural forms and looking more into the folklore around ferns.

I've been squirrelling away all year working on a very large fern piece. My previous artworks are all smaller than A4 in size, whereas this one is A1. I'm hoping to finish it by the New Year so watch this space!

Have you ever exhibited your work, or do online social channels make it much easier for you to present your work?

I have just started exhibiting my work It is currently in the Rye Art Gallery and Alter Ego Gallery in Battle, East Sussex. Seeing work hanging on the wall in a gallery is exciting, as is knowing that all kinds of people will see it in real life. It is also incredibly reassuring to know that galleries are interested in the work you produce, especially for someone just starting out.

The internet is a remarkable place too. It's a huge platform for sharing work and interacting with so many people, not just art and design communities but botanists and fern societies for example! Another plus is that you can do it all from behind a messy desk full of paper and ferns, which is perfect for me as I can be quite the hermit.

Helen, thank you for taking time to answer my questions. I'm sure our members will appreciate your work and the amount of detail that goes into it. Keep it up!

It has been my pleasure. I'm afraid I don't know much about the technical aspects of ferns but I do know lots about collecting, pressing and making pictures from them and I plan on becoming a member in the new year. ❐

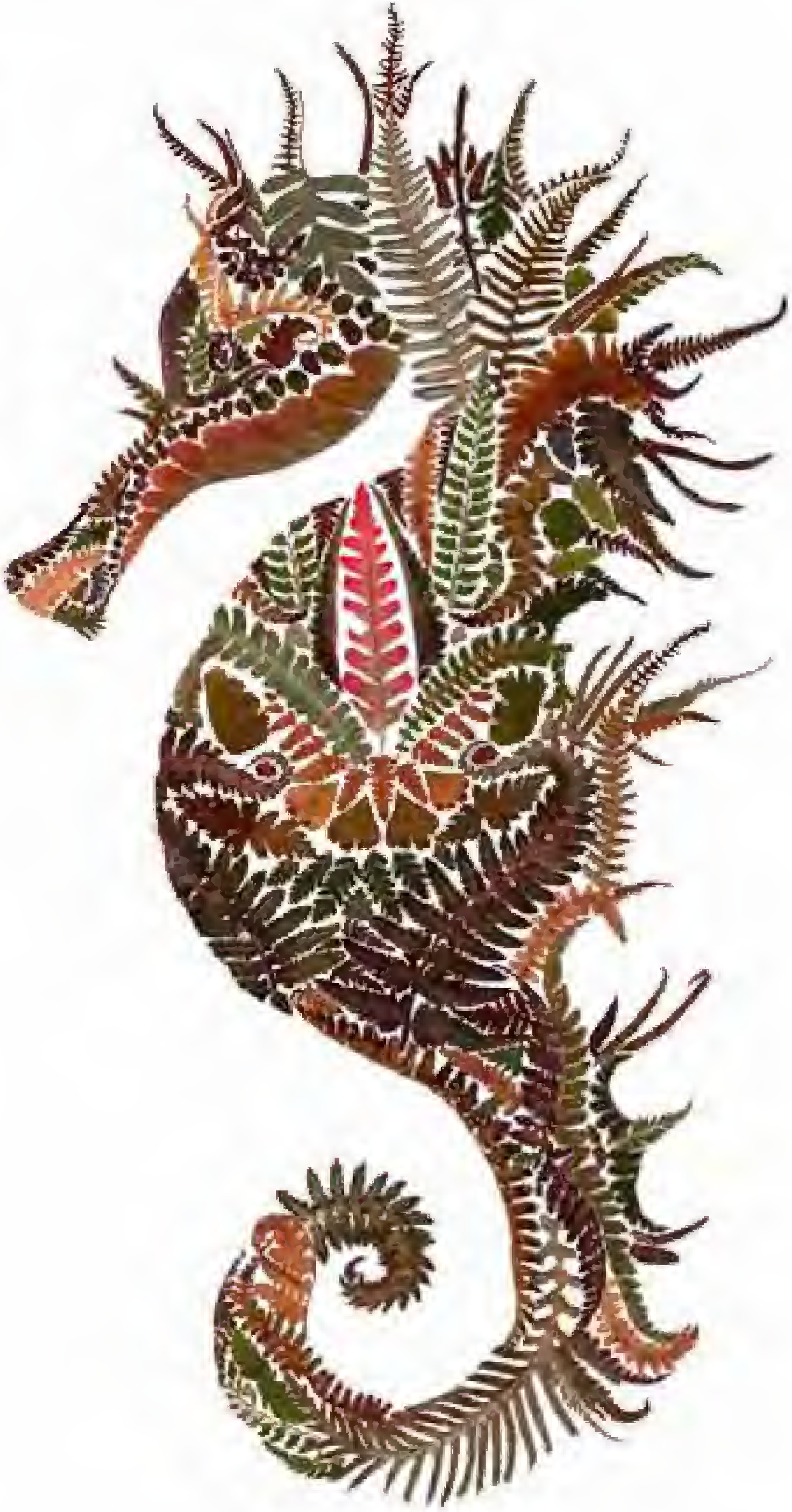

Fig. 11. Spiny Seahorse made from pressed ferns.
One in a series of five fern pieces based on natural history collections
© Helen Ahpornsiri

National collection of Hart’s tongue cultivars

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Having a national collection of ferns can pose some challenges and moving the Hart’s tongue collection from Hampshire to Wales wasn’t without some difficulties.

Just the task of moving some 250 or so plants, uplifting them from the ground in a small time frame as we sold our house, potting them up and then finding a suitable removal company that would take so many plants.

Once at the new garden the Hart’s tongues spent their first winter sitting in pots behind the house as the new fern beds were still just a meadow and hadn’t been cultivated before.

The next task of planting was made difficult by the stony ground and thin soil as it could take all day just to put a small number of plants in their new home. As there were 250 of them that were waiting in pots the job was daunting.

Eventually planted in the new beds it has taken several years for the plants to settle and many of them have struggled to regain the vigour they had in the Hampshire garden. The soil here is acid and so lime has to be added on a regular basis and I also used seaweed meal and garden compost.

I see the role of the national collection holder as to propagate plants and especially the rare cultivars and distribute them to other interested fern collectors. Although so many old cultivars are now lost it is still possible to find the odd one lurking about in old gardens and they need to be propagated and brought back into circulation.

Having many different cultivars of a fern group means there is a chance of creating more by collecting spores and mixing them. I try to set a new batch of mixed spores each year and sometimes I am lucky in producing something different though with me it can take several years to see the results.

This year I was able to plant out a number that were from a cross between *Asplenium scolopendrium* ‘Peraferens’ and ‘Muricatum’. The young plants have been growing on in cloches for some time and gradually developing their new characteristics. The plants look like ‘Peraferens’ (Fig. 3) but have a raised ridge on the surface of the frond like a file from the muricate parent (Fig.1). The question is should the new plants be called ‘Muricato-Peraferens’ or ‘Perafero-Muricatum’?

Another unusual fern that has been planted out in the garden was grown from spores taken from a strange looking Hart’s tongue found growing in a wall. It is very dwarf with thick marginate fronds all ending with a horn and pocket as in ‘Peraferens’. All the plants raised from this sowing had these same characteristics. I have called this one ‘Discovery’ and as you can see from the picture it is quite unearthly looking (Fig.2).

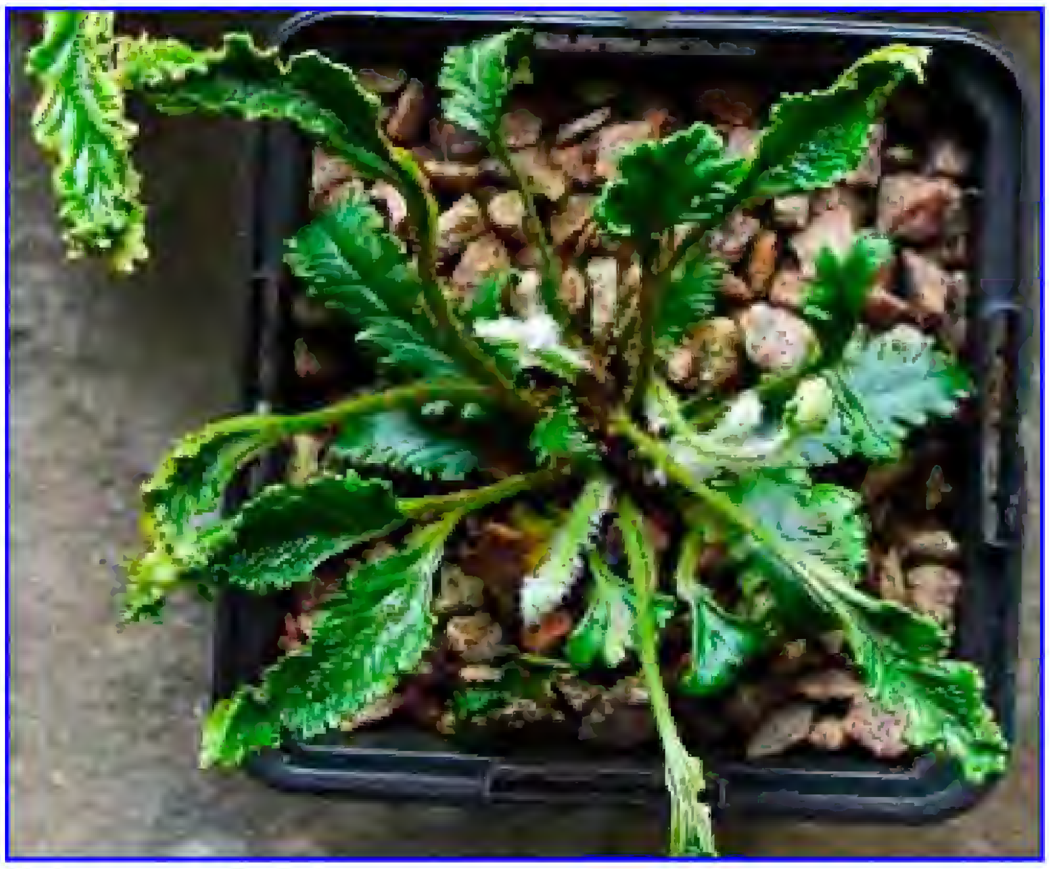

Fig. 2. *Asplenium scolopendrium* ‘Discovery’, raised from spore, is very unearthly looking

I want to take this opportunity to thank all the BPS members who have travelled the long distance to visit this garden to see the collection of ferns in 2014 and anyone visiting West Wales in the future would be very welcome. ❐

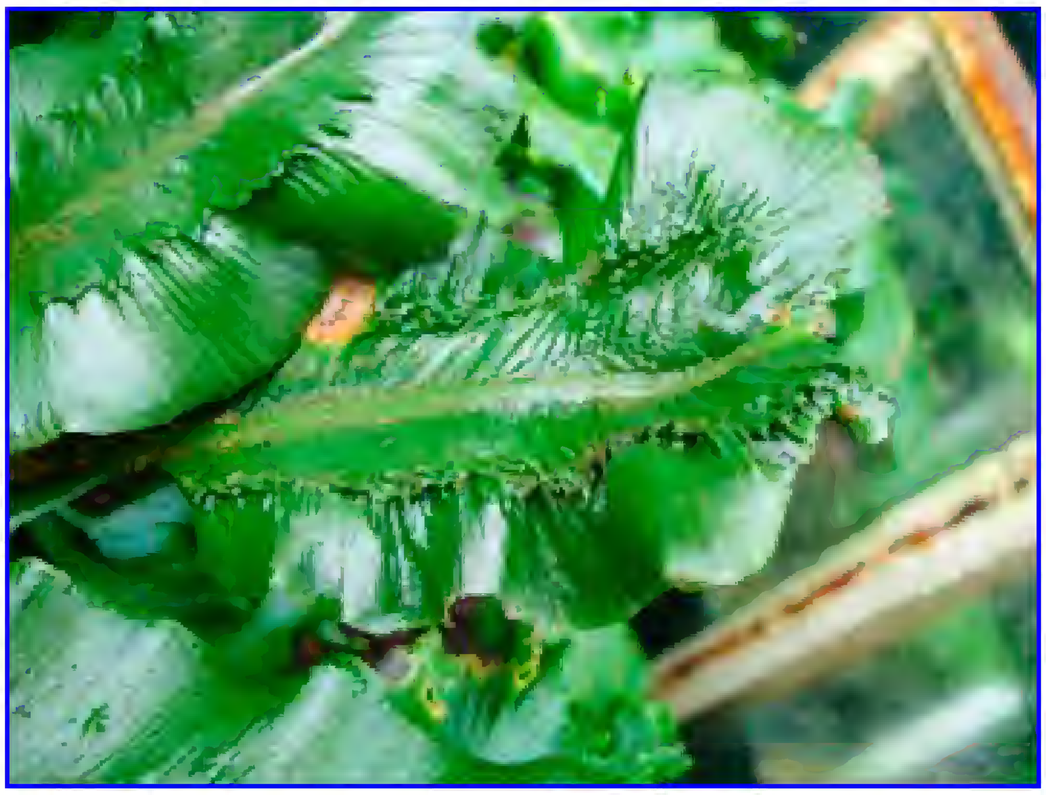

Fig. 1. The *Asplenium scolopendrium* raised by crossing spores from ‘Peraferens’ and ‘Muricatum’, note the raised ridges from the ‘Muricatum’ parent

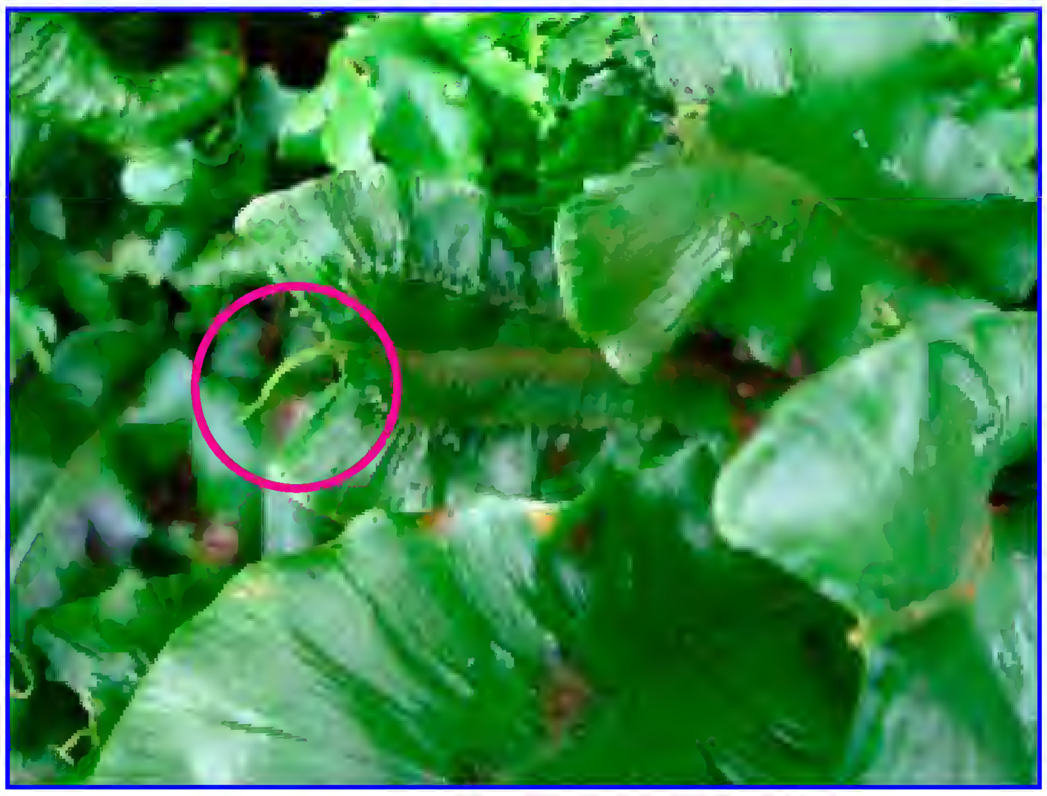

Fig. 3. Another view of the cross showing the horn from the ‘Peraferens’ parent (circled)

The Fern that Never Gave Up—The Continuing Story

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In a short article, "The Fern that Never Gave Up", in *Pteridologist* Vol 5 issue 6, I described my unsuccessful attempt to re-home a specimen of *Asplenium trichomanes* subsp. *quadrivalens* from a disused railway bridge to my rockery. The fern failed to thrive and, despite my ministrations, finally rotted away. But on the site of its last rotting frond a little array of prothalli appeared (Fig. 1) which I suggested had come from spores that had failed to get away from the sori and which germinated on contact with the soil.

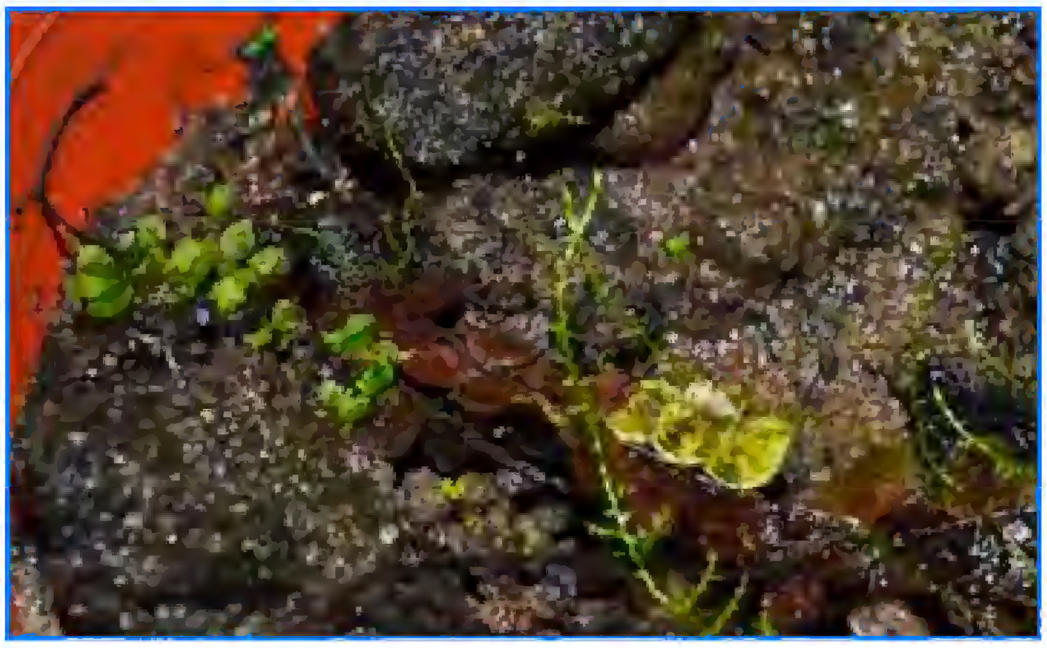

Fig. 1. Prothalli on the site of a decaying frond (27 January 2013)

I am most grateful to Dr Elizabeth Sheffield of the University of Manchester who contacted me about the article, making the interesting suggestion that the prothalli might not have come from spores, but have been produced aposporously from the tissue of the dying sporophyte frond itself. On reflection the evidence strongly supported this. These prothalli were unusual in habit: flat and plate-like, lying horizontally on the soil, quite unlike the neat, almost-upright, cordate ones (Fig.2) which appeared when I sowed spores of this subspecies that I had obtained from a different plant. Furthermore, the almost regular spacing of these prothalli was suggestive; they appeared to echo the location of the pinnae on the original frond, as though each pinna contained a single growing point that gave rise to a prothallus when it came in contact with the soil.

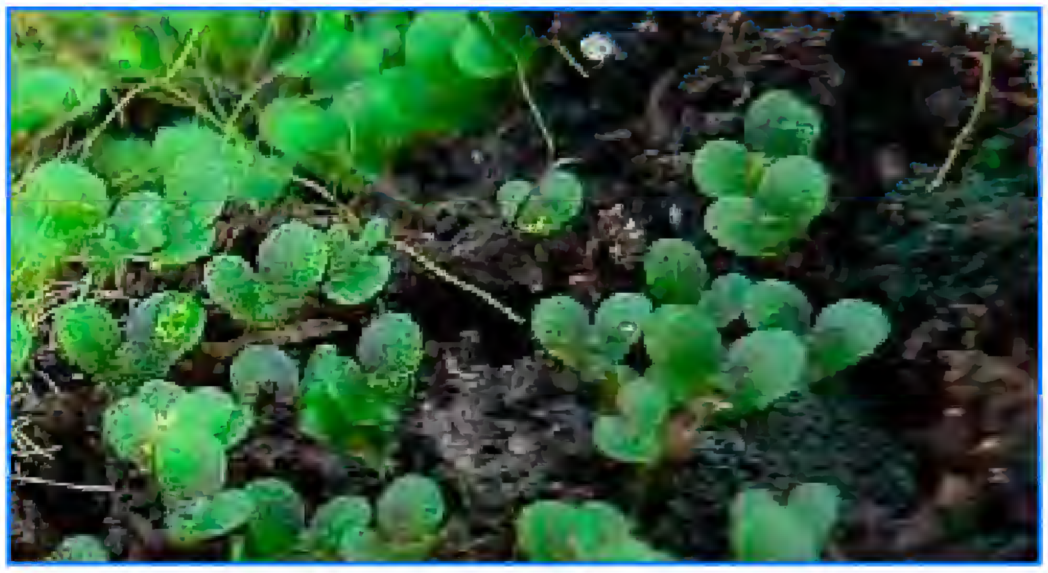

Fig. 2. Prothalli of *Asplenium trichomanes* subsp. *quadrivalens* produced from spores

Of course, because gametophytes produced aposporously have bypassed meiosis, they have the same genetic complement as the parent sporophyte—in this subspecies they would therefore be tetraploid. It has been claimed that such polyploid gametophytes are normally infertile[1]; if tetraploid examples—as I now suspected these to be—did succeed in producing sporophytes by the usual sexual process, those offspring would receive a full identical tetraploid chromosome complement from each parent and would therefore be octoploid. I decided to keep my unusual prothalli under observation. If they produced sporophytes, I wondered if there would be any visible evidence that they were octaploid.

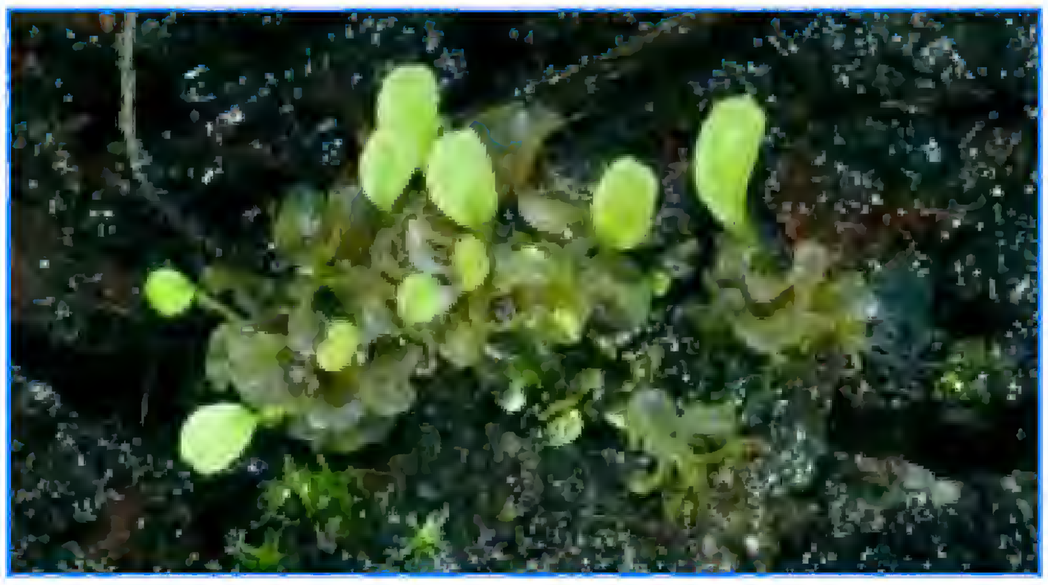

Fig. 3. Identical sporophytes from the prothalli from the decaying frond (9 Aug 2013)

They did indeed produce sporophytes. At first these appeared normal (Fig.3) except that all were identical—in striking contrast with the remarkable diversity of form normally exhibited by juvenile examples of *A. trichomanes* subsp. *quadrivalens* grown from spores (Fig.4). Moreover, they grew rather slowly. Even 18 months after photographing that array of well-formed, possibly aposporously produced prothalli in January 2013, the sporophyte progeny were still at the two-to-three frond stage. In contrast, from spores of this subspecies sown in July 2012 I pricked out my first six-frond sporophyte 13 months later and from more sown in February 2014 I pricked out sporophytes in September, just seven months later

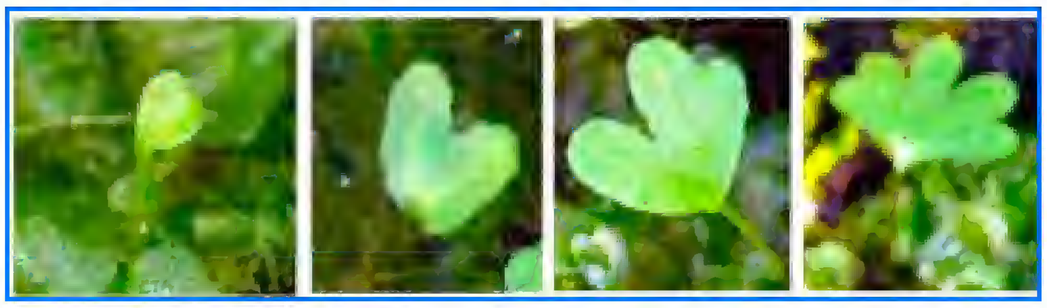

Fig. 4. Diversity in juvenile examples of *A. trichomanes subsp. quadrivalens* from spores

As they developed, these sporophytes did show slight differences in morphology from "normal" specimens (Fig.5), although in such a variable species it is always difficult to be sure. Their pinna outline seems more rounded and less deeply incised. But perhaps most striking is that, after allowing for the individual plants in the group being at slightly different stages of development, they are all still identical in form

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[1] "The 2n aposporous gametophytes and the 1n apogamous sporophytes are usually infertile under natural conditions because of disruption of cytological events." Hans Lambers, Article 'Plant', Encyclopaedia Britannica website, 2014. (www.britannica.com/EBchecked/topic/30203/apospory)

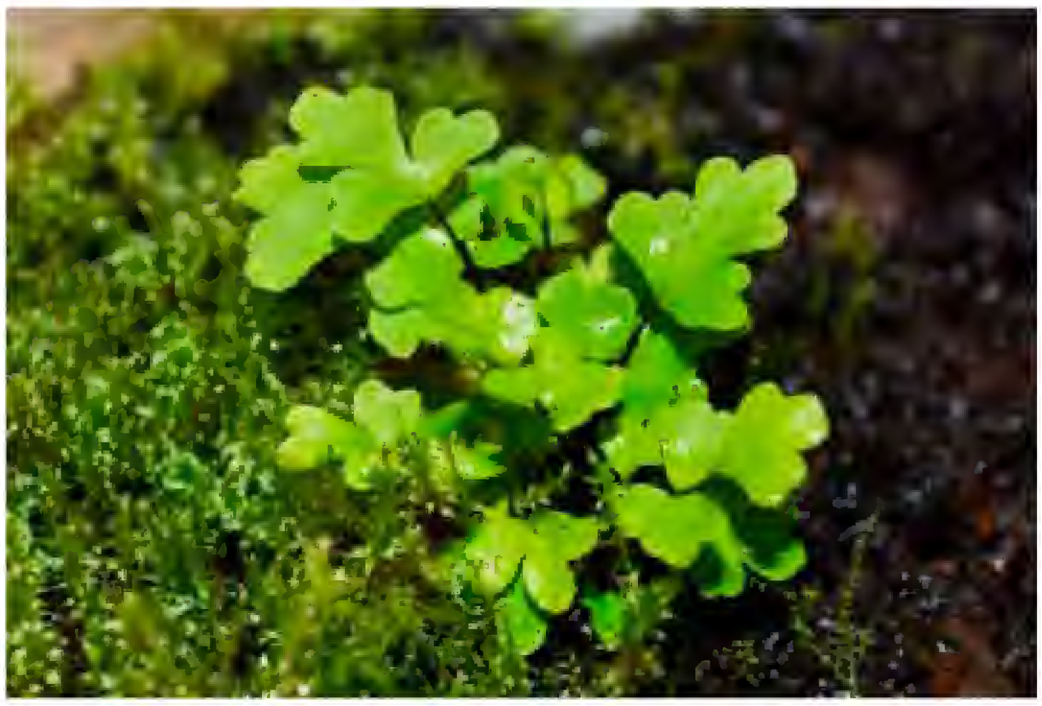


Fig. 5. Suspected octaploid sporophytes showing differences from "normal" specimens (16 July 2014)

This identity of form leads me to conclude that all have the same genetic complement so that the prothalli must indeed have been produced aposporously. But are these sporophytes the octaploid offspring of a sexual union or were they perhaps produced apogamously or parthenogenetically? Ultimately only cytological tests beyond my resources can answer the question. The possible differences from "regular" sporophytes suggest that they might be the result of a sexual union and so octaploid, unusual though that would be. If they had been produced apogamously or parthenogenetically, they would have the same genetic complement as the original fern and so presumably would have been of normal appearance. If they are octaploid, maybe the duplicate chromosome complement is responsible for their slow growth—if the pairing of two appreciably different chromosome sets produces hybrid vigour, maybe pairing two identical sets causes developmental torpor! If these sporophytes develop sori, it will be interesting to discover whether they produce viable spores.

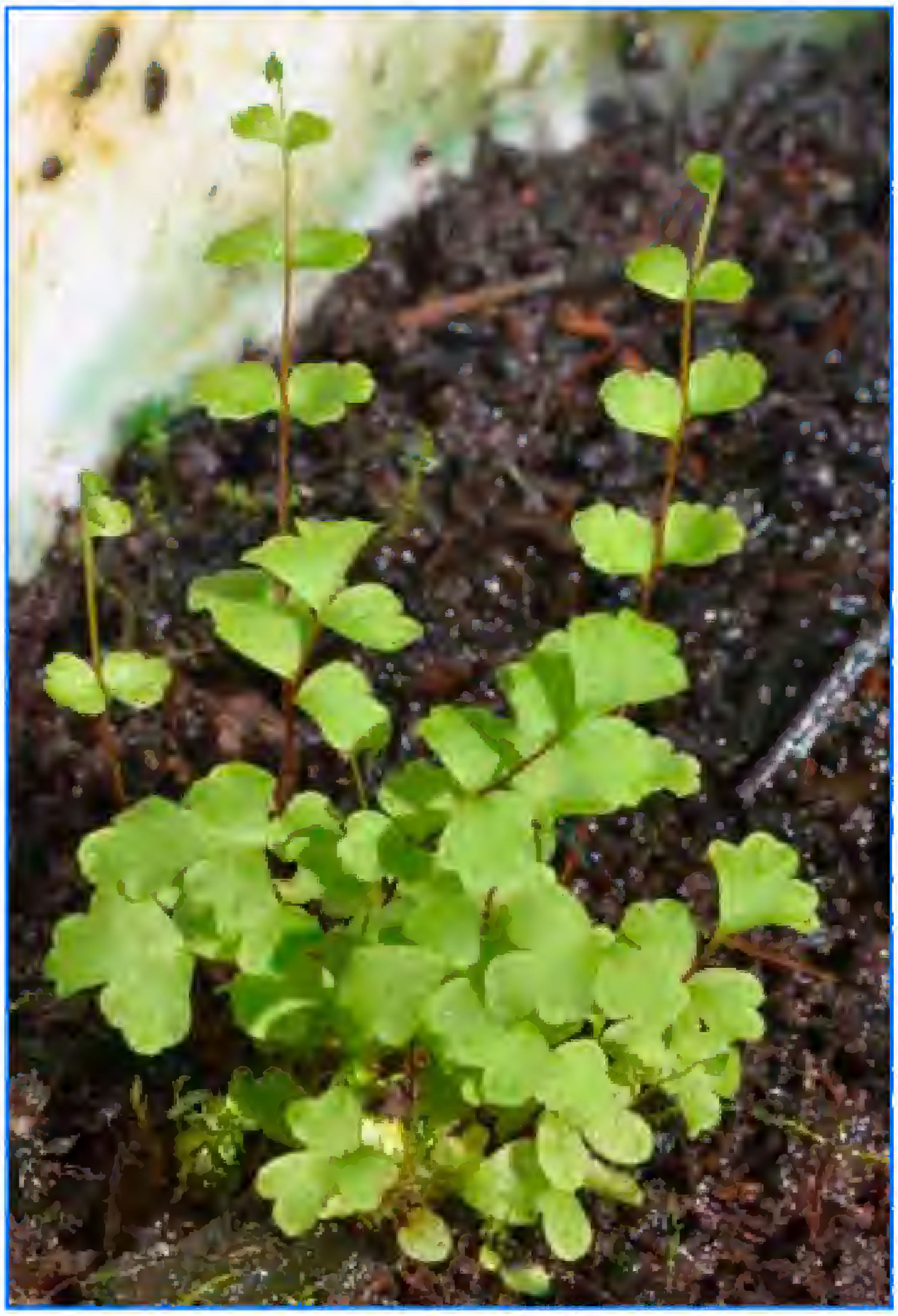


Fig. 6. The developing suspected octaploid sporophytes (31 August 2014)

As for "the fern that never gave up", its genes now live on in a cluster of remarkable offspring. With such amazing survival strategies it is no wonder that *A. trichomanes* thrives all over the planet. I had heard of apospory, but never expected to witness it "in my own back yard". And it is this remarkable capacity of ordinary, "everyday" ferns to keep on surprising me that fuels my interest in them. ❐

BOOK REVIEW.

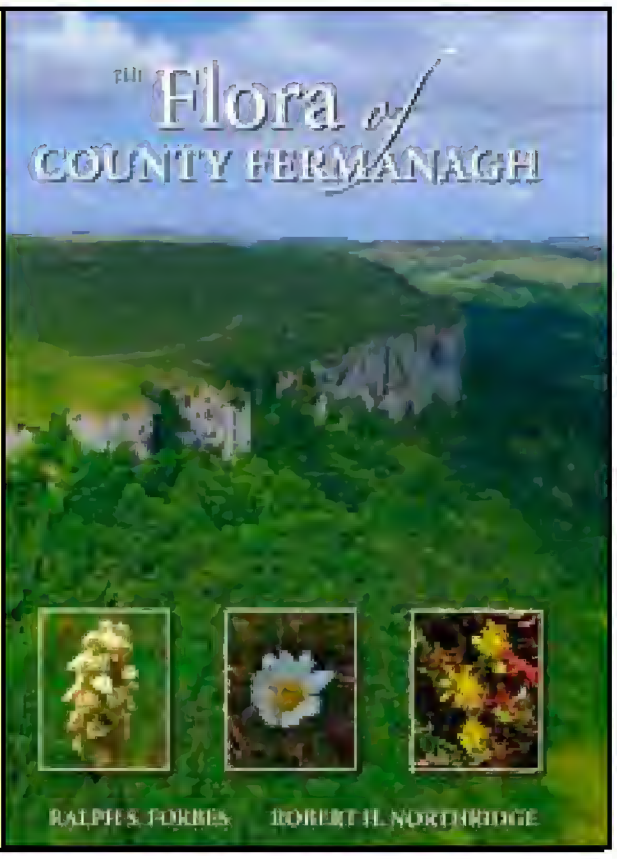
Flora of County Fermanagh by Ralph Forbes and Robert Northridge. 864 pp.,numerous col. Pl., 2012. Hardback. ISBN 978 1 905989 28 7. Published by National Museums Northern Ireland. Price about £26 from on line booksellers

Here we have a huge volume covering a county of Northern Ireland that has never before had its own flora. Accounts of the Ulster flora have included it but due to its rural character Fermanagh has always been one of the less well known of the six counties. Fermanagh is a wet county. It rains a lot, up to 195 cm/year and there are many bogs and lakes. The south western region is moderately mountainous rising to 670 metres altitude with much exposed limestone. This range of habitats is good for ferns. Catching my eye were *Equisetum pratense* and *Equisetum x trachyodon*, all three native filmy ferns including sporophytes of *Trichomanes speciosum*. *Polypodium australe* (*P.cambricum*) is frequent, but given the wet nature of the terrain *Thelypteris palustris* is rare. *Phegopteris connectilis* is also rare as is the case in much of Ireland. *Gymnocarpium dryopteris* is unknown

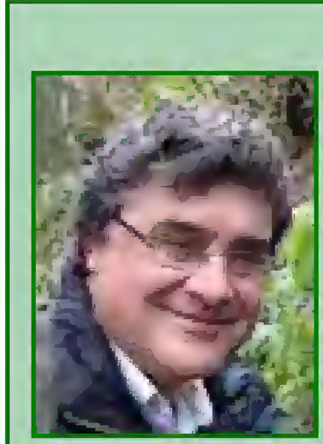
The fern highlights of the county`s flora must be *Asplenium marinum* and *Polystichum lonchitis*. A strong colony of *A.marinum* occurs at 210 metres altitude and 17 km from a tidal estuary. Hardly a maritime site! *P.lonchitis* is very rare with only a single plant known in 1988. The flora records 5 plants known in 2012, Since then Mark Jannink has visited the site and found a sixth plant! Not far away over the border in County Leitrim in and around Glenade it is locally abundant!

The flora contains very informative accounts of all species, usually accompanied by a map and not infrequently by a photograph. Records are mapped as pre or post 1976.

Martin Rickard



Making Quillworts Count!
The 2014 Lizard *Isoetes histrix* survey



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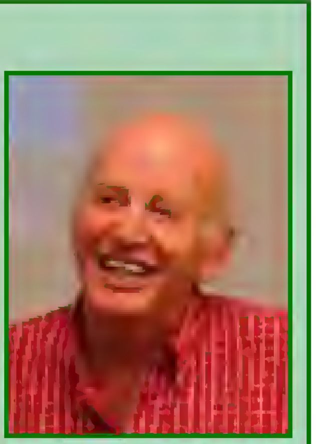

In the most recent Fern Gazette (Pearman *et al.*, 2014) we reported on monitoring work carried out from 2010-3 on the threatened Land Quillwort (*Isoetes histrix*) at its most northerly (and only British) locality on the Lizard peninsula in Cornwall. Since a detailed survey in 1982 (Frost *et al.*, 1982), the first ever attempted, little quantitative assessment of this and many of the other small specialities of open habitats here had been made. Anecdotal evidence however suggested that changes in management, scrub encroachment and possibly climatic factors had all had a negative impact. The results to 2013 strongly supported this supposition, suggesting an extremely alarming >90% decline in population size since 1982, but threw up as many questions as they answered. Furthermore we believed that in each of the recent survey years that the weather might have been sub-optimal for the plant and other impediments had prevented the same level of detailed survey as had been accorded in 1982, which might result in an overly pessimistic view. It was therefore proposed that in spring 2014, following what seemed like a more auspicious autumn and winter, that we gather a team to re-survey, following the same protocols as in 1982. Invitations went out and finally over a weekend in April a group of 18 people, including BPS and BSBI members, local natural historians and a representative from Natural England, assembled to take on the challenge.

Each of the known historical sites had been precisely marked up on laminated maps and, following an introduction to the plant for those unfamiliar with it, we were then divided up into groups and given target sites to resurvey. Where possible direct counts of all plants in a site were to be made; but on the bigger areas it would prove necessary to do sample quadrats and then extrapolate – as had been done in 1982. At all times we were on the lookout for new populations once the distinctive sorts of habitats that the plant occupies had become more familiar, but we were conscious that some may have eluded us where growing in less typical habitats.

Fig. 1. David Pearman takes the group through an introduction to *Isoetes*, its habitat on the Lizard and how we need to record it – near Kynance car park

Sadly the weather hadn't read the script! Pete Stroh, the lead author on the new England Vascular plant red-list, has on several occasions said that it was the worst he has ever tried to botanise in. It's clearly drier in East Anglia. On exposed headlands it was actually a boon to have to be on hands and knees as standing up was a dangerous option!

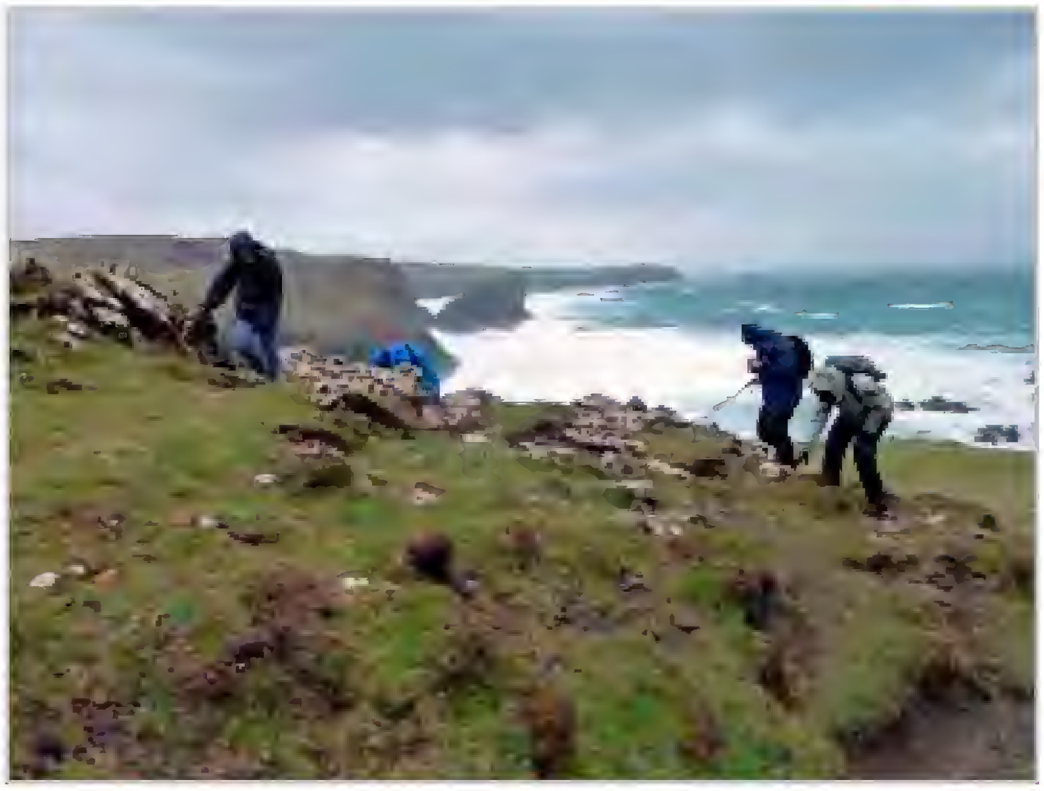

Fig. 2. A group systematically searching while trying not to be blown away! (Photo: Ian Bennallick)

We soon began to become familiar with the plant's particular habitat but finding it definitely a challenge as it grows with a suite of annoyingly similarly looking things! Plants are easiest to spot as they start to die back and go a yellowish colour not shown by the other similar plants.

When our old target sites were located we split up to hunt for the plant; when found the extent of the populations were established and marked.

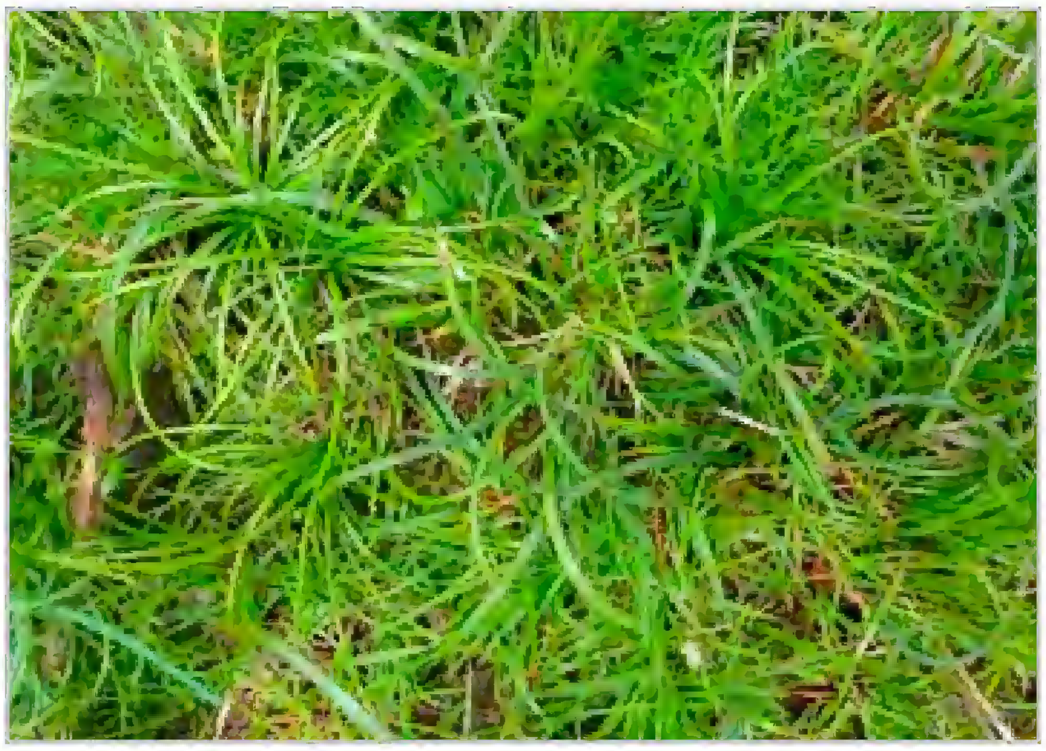

Fig. 3. Turf near Holestrow - lots of quillwort plants and lots of pseudo-quillworts too

This was relatively easy on small, restricted, often path-side sites but more problematic on the larger serpentine rock outcrops. The area occupied was then divided up to facilitate a more accurate count. At the major sites (Predannack, Holestrow and Carnbarrow) a gridded system was laid across all of the area of suitable habitat and counts made in a pseudo-randomised selection of the grid cells. The figures were then extrapolated to give a total count as had been done in 1982.

Fig. 4. FJR and Peter Lambley – a small path-side population SE of Verran Head
(Photo: H.J. Crouch)

Individual plants were identified and marked by coloured pins to prevent double counting and also to help visualise the pattern of distribution, which might tell us more about the reproductive and dispersal mechanisms employed by the plant.

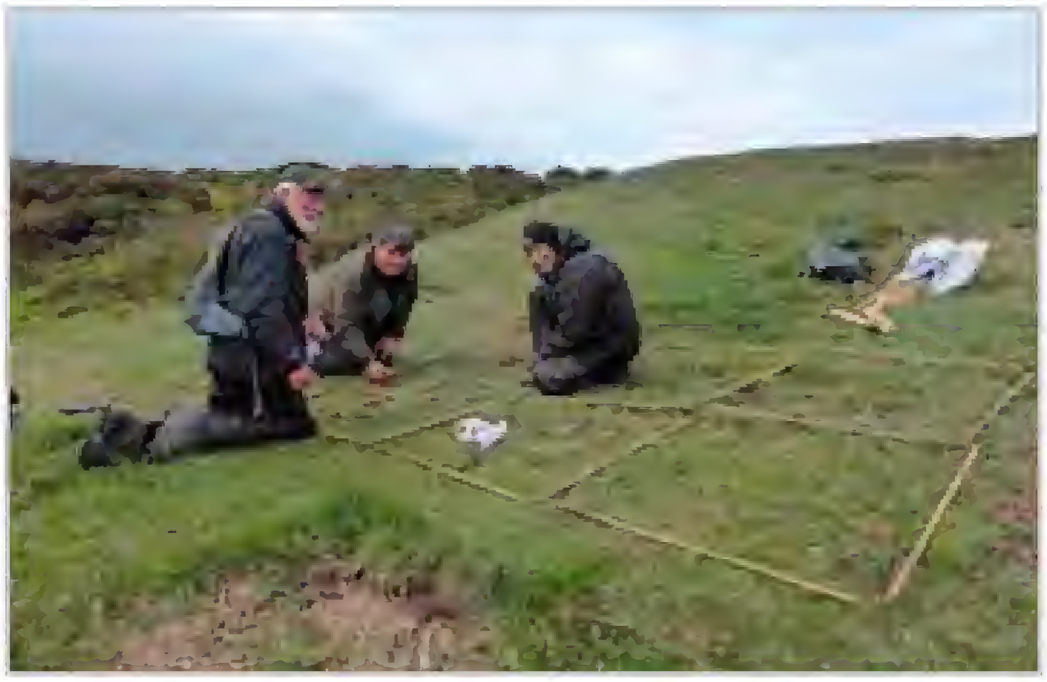

Fig. 5. Counting plants at Holestrow (SW6912)
(Photo: H.J.Crouch)

At this site direct counts were made from 12 of the 49 0.8m^2 cells identified as likely to support the plant. Very recent gorse and scrub clearance, organised as a consequence of earlier monitoring feedback, has undoubtedly benefitted the plant here. The 1982 survey calculated there were 5,376 Quillwort plants here; during the 2010-3 period the maximum recorded was *c.* 400, *i.e.* <8% of the past total. In 2014 we calculated the population to be 3,241 plants, a very distinct improvement on recent years but still only about 60% of the previous total.

The greatest problem we have is with the biggest site, that at the serpentine outcrop at Predannack (SW6915). While it is possible now with GPS technology to record quite precisely the maximum extent of the species occurrence, the varied nature of the site, which is interspersed by encroaching gorse scrub and outcropping bare rock, makes it extremely difficult to calculate the true area occupied by the *Isoetes*. The varied nature of the occupied areas also means that population densities differ markedly. We thus have much lower confidence in any figure derived from extrapolation. We can however argue that as we have followed the same principles as employed in 1982 the figures should be broadly comparable – the same errors cancelling each other out.

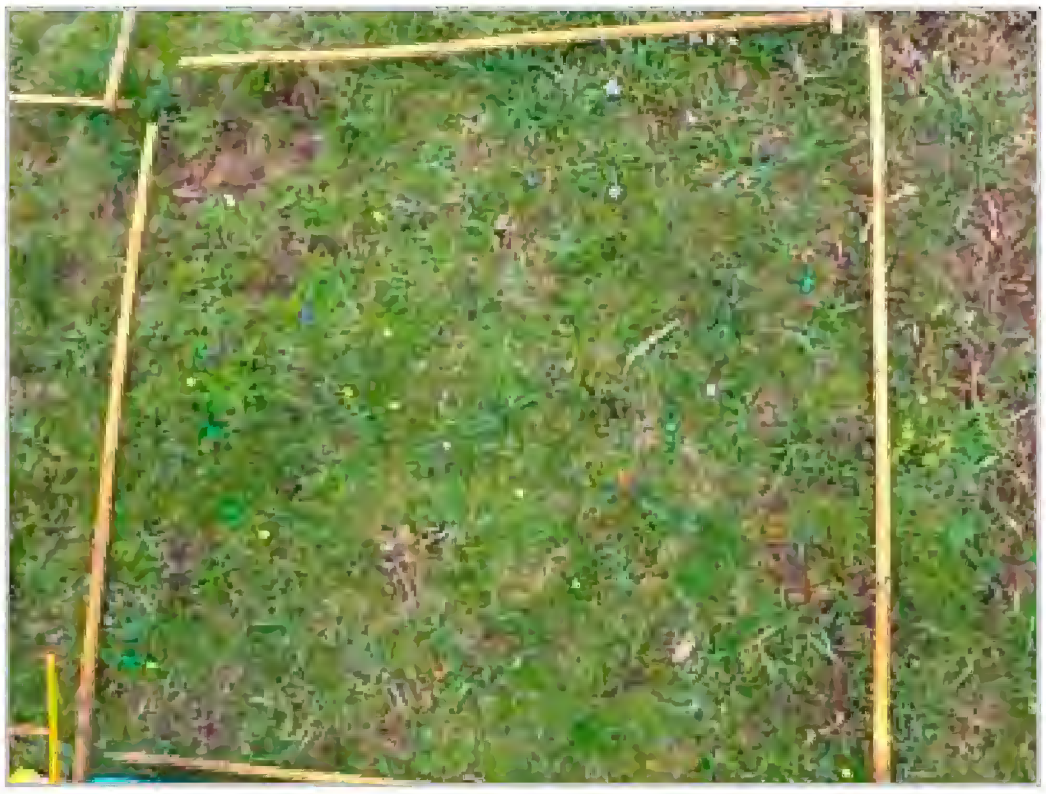

Fig. 6. Quadrat marked out – the canes 0.8m long. 24 *Isoetes* plants were found in this quadrat. The numbers of plants recorded in the quadrats at this site varied from 0 to 149. The high levels of variation give some concern for the accuracy of extrapolated figures.

In 1982 it was calculated that 69,000 plants occurred here, just over 70% of the total Lizard population. In 2014, having calculated the total area, we counted random quadrats within that, and using ‘bootstrapping’ calculated a total of between 33,032 and 78,895 plants, with an average of 54,053. However the two recorders most familiar with the site (DAP & Ian Bennallick) felt that this method gave a totally misleading picture, under-estimating the amount of unsuitable habitat (rock face, gorse and rank grass), and were unwilling to accept that extrapolation. For this article we have used their estimate of *c.* 10,000 plants.

Fig. 7. Site of the currently second biggest population, Holestrow (SW6912). The morphologically similar *Scilla verna* (Spring Squill) is particularly abundant here. Only a limited area contains the quillwort.

While we have no direct evidence by which to challenge the earlier figure we do tend to regard it with increased disbelief. The area suitable for the plant has almost certainly decreased through scrub encroachment and consequent soil enrichment, but not to the extent that we feel it would cause the level of apparent loss suggested.

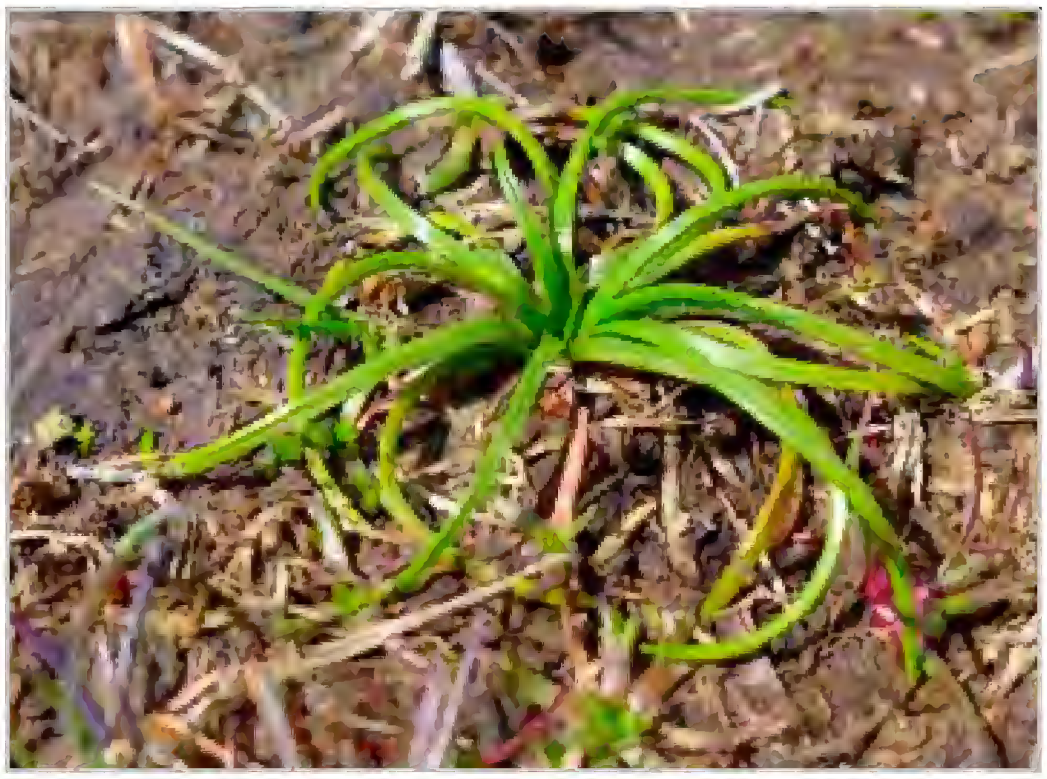

Fig. 8. *Isoetes histrix* near Verran Head

This site is clearly of utmost importance, not least because it supports similarly significant populations of other Lizard specialities, from bryophytes to rushes and clovers. As this population, however, plays a disproportionate role numerically and because of the confidence we can place on the data, we would almost consider excluding it when thinking about assessing the plant's status on the Lizard with regards to the efficacy of our management actions for it.

So how did we do – and what does it tell us?

The combination of optimal weather conditions and a much greater recorder effort has shown that the situation for *Isoetes histrix* in the British Isles is probably a little less apocalyptic than Pearman *et al*., 2014 feared, but we still have considerable cause for concern. Many questions still remain but we feel we have a clearer idea of what these are and where we might find answers as a consequence of this work.

Fig. 9. The Predannack serpentine outcrop – the single largest UK *Isoetes histrix* site

In total the plant was counted in 42 discrete sites; this must be compared with the 68 known in 1982 and 17 discovered subsequently; 85 in total. So while we found an improvement on the 37 sites known during the 2010-3 survey period this number still represents a loss of just over 50% at the site level since 1982.

1 km sq.	Sites 1982	1982 counts	Sites 2010-13	Counts 2010-13	'New' sites	'New' sites counts	Total all sites 2010-13	Total counts 2010-13	2014 sites	2014 counts
SW										
6614	4	550	1	300			1	300	1	300
6615	1	1650	1	100			1	100	1	31
6617	18	9000	3	200			3	200	13	1496
6713	5	2460	3	250	3	10	6	260	3	84
6714	6	650	1	300	4	220	5	520	4	388
6715	4	1050	0	0	2	120	2	120	3	522
6715	1	69000	1	1000			1	1000	2	10003
6813	10	6700	3	30	3	50	6	80	5	112
6814	2	170	0	0			0	0	0	0
6912	8	6500	2	400	2	300	4	700	3	5156
6913	1	0	0	0			0	0	0	0
6919	1	0	0	0	1	10	1	10	1	167
7018	1	60	1	30			1	30	1	24
7113	0	0	0	0	1	1000	1	1000	1	1981
7116	1	20	1	20			1	20	1	60
7217	1	0	0	0			0	0	0	0
7321	0	0	0	0	1	20	1	20	1	48
7716	4	80	3	50			3	50	2	26
Totals	68	97890	20	2680	17	1730	37	4410	42	20398

Table 1. ***Isoetes histrix*** **survey summary figures**

Making Quillworts Count!

The individual population counts (see Table 1) tell a very similar story. In only one site (SW7116) known in 1982 did we find a population increase; from 20 to 60. Every other extant 1982 site had shown a decline, often extremely serious.

In terms of the total number of individuals recorded we now apparently have roughly 20% of that known in 1982. Even if we disregard the massive Predannack (SW6715) population (still the biggest and responsible now for almost 50% of the British population) there has been a decline of over 64%.

The GB Red-list (Cheffings & Farrell, 2005) regarded *Isoetes histrix* as VU on the basis not of decline but as it occurred in 5 or fewer sites, i.e. threat was likely through stochastic effects. Subsequently the England Red-list (Stroh *et al.*, 2014) classified it as VU under category B – i.e. a restricted range and evidence for decline. We would now suggest that our data indicates that, even if it is considered at either site number or individuals, the 50% decline threshold necessary for EN – endangered status has been met.

We now have plans to complete a direct count for the Predannack population in 2015 so that we can address our concerns over extrapolation from sample data. We are very keen to complete a similar survey of the Channel Islands populations, which are also believed to be in long-term decline, during the BPS 2015 Spring meeting. ❐

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A visit to Le Monde des Fougères

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If you find yourself, as I did, holidaying in Nice in the south of France, I can thoroughly recommend a visit to Le Monde des Fougères, situated 45 mins from Nice by bus at Roquefort- Les-Pins. The nursery is located on a quiet leafy road and, upon ringing the bell, Olivier Ezavin, the owner, greeted me with a huge smile and smoked black Russian tea which proved to be delicious.

Fig. 1. The sign welcoming you to the nursery

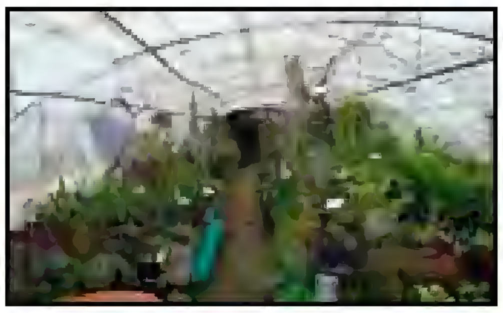

Fig. 2. One of the polytunnels full of ferns

The nursery has five large polytunnels full of immaculate plants with many fern genera from cold hardy to tropical. I did go with a list in mind but was so overwhelmed by all the treasures it soon became evident that I would need to arrange to get them shipped back to the UK.

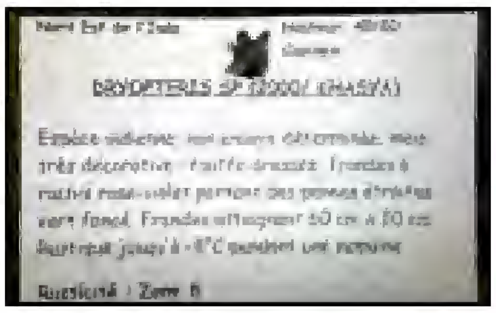

Fig. 3. The sign used for the mystery *Dryopteris* species from India

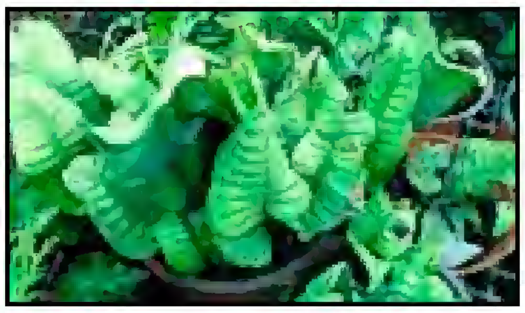

Fig. 4. *Neolepisorus ovatus* f. *truncatus* looking splendid

Olivier gave us a tour of all the tunnels, pointing out special plants. His English was far superior to my comedy French.

Highlights for me were the lovely big pots full of *Neolepisorus ovatus* f. *truncatus* (Fig. 4) and *Davallia pentaphylla* (Fig. 6). There was a *Dryopteris* collected at 2000m in the Khasya hills, India, with beautiful purple stipes, currently nameless. (I am waiting for Tim Pyner to drop in to look at my specimen)

If I had to pick a "fougere de jour" it would have to be *Coniogramme emeiensis* (Fig. 5). A whole bench of this beauty growing in deep shade was a real sight.

After a very enjoyable afternoon it was time to catch the bus back into Nice. Upon our leaving Olivier gave me a copy of his new book *Fougères rustiques pour le jardin,* joking that I needed to brush up on my French.

Merci monsieur Ezavin. ❐

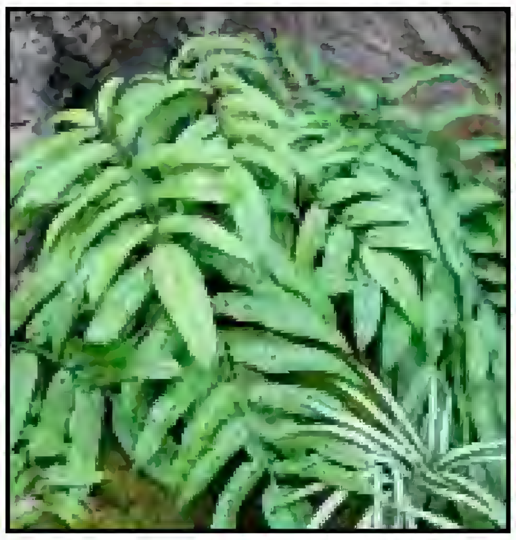

Fig. 5. *Coniogramme emeiensis* was my "fougere de jour"

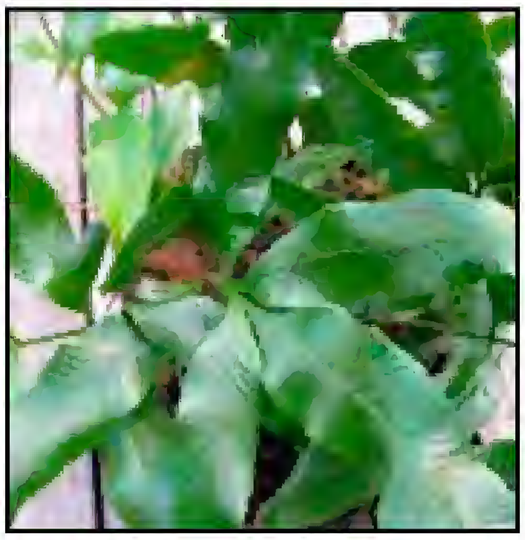

Fig. 6. *Davallia pentaphylla,* a climbing fern

The Alternative Fern Flora

THE BEACH FERN, *Asplenium ruta-muraria*

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At Helgumannen on the north-west coast of Fårö, an island close to the north end of Gotland in the Baltic, *Asplenium ruta-muraria* grows on the beach within a few metres of the water's edge.

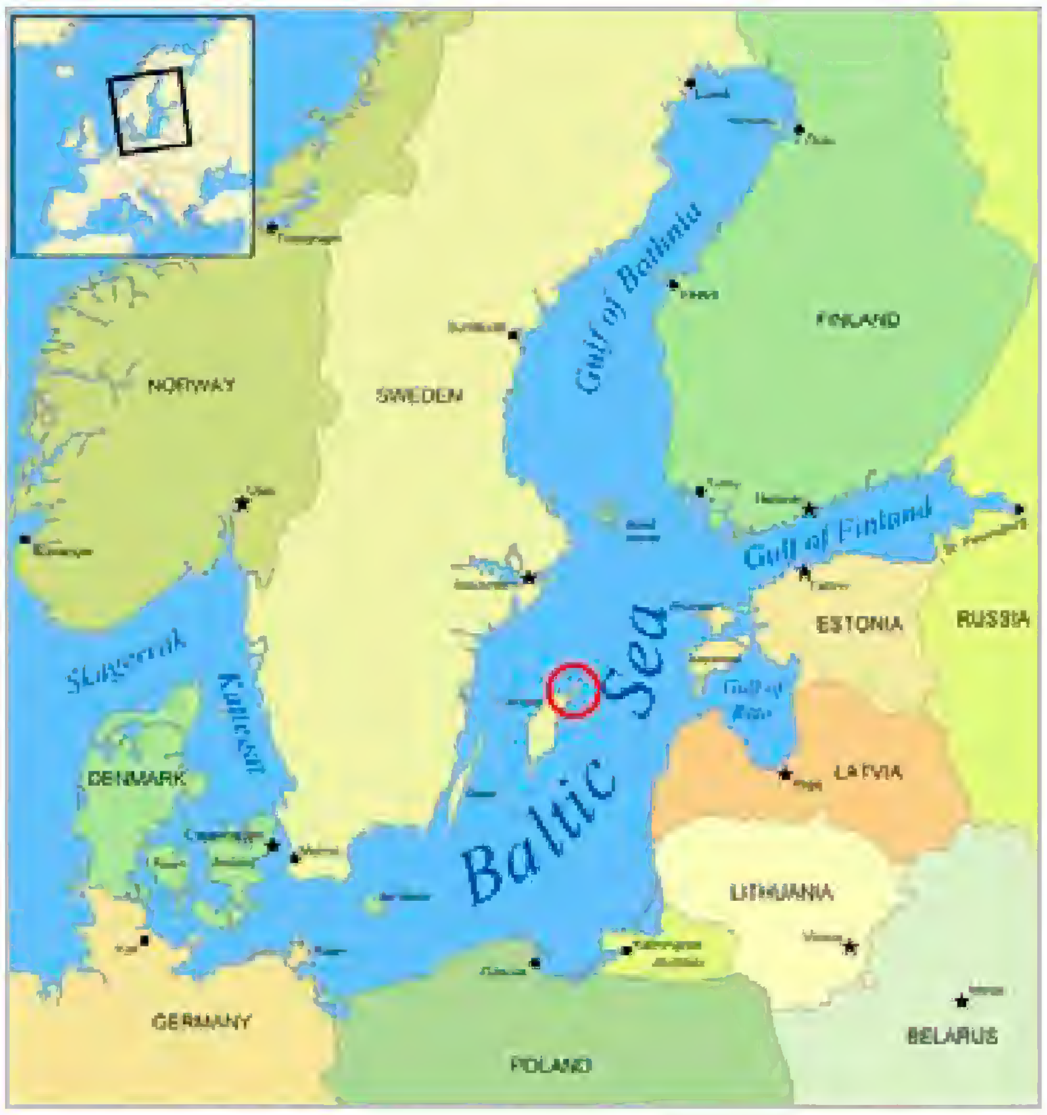

Fig. 1. Map of the Baltic Sea with the island of Fårö marked with a red circle

Fårö and Gotland are parts of the same plateau, consisting mainly of limestone, about 176km (109 miles) long and 52km (32 miles) wide at its broadest. The plateau is about 20m (65ft) above sea-level and very flat with occasional small hills, none higher than 82m (269ft). Much of the coast consists of eroding limestone cliffs, with grotesque rock stacks, eroded outcrops, large boulders, and broad beaches consisting entirely of limestone rubble.

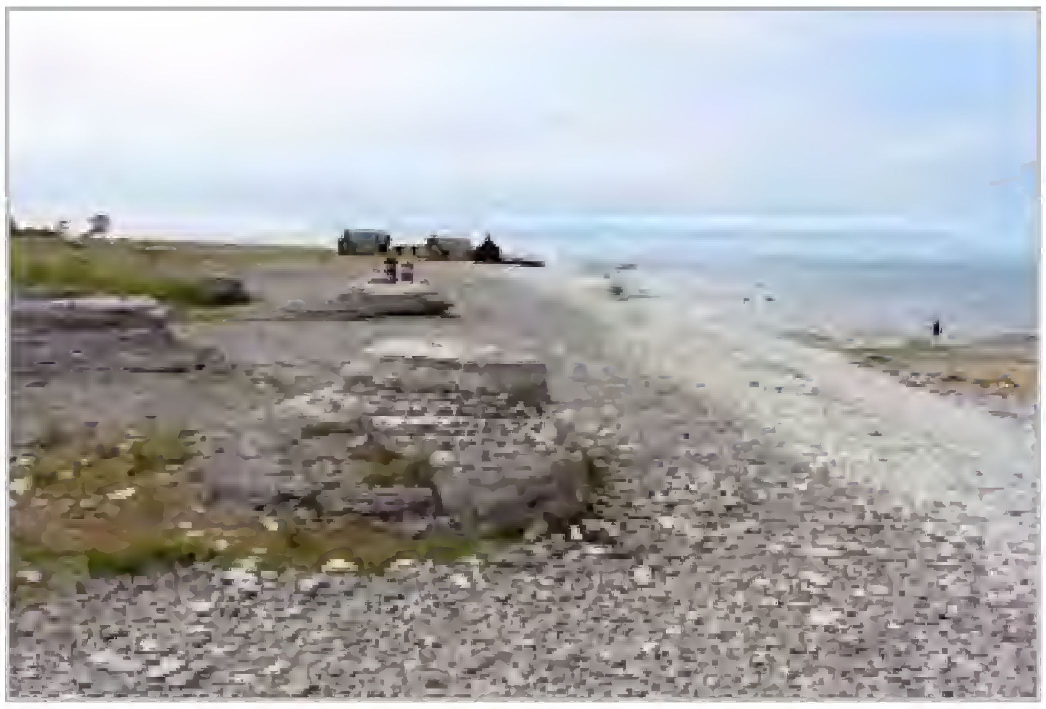

Fig. 2. The beach at Helgumannen, Fårö

Several features of the Baltic Sea influence the shore flora. It is brackish, with a salt content less than a third of that of the open ocean; despite this it rarely freezes around Gotland. It is almost non-tidal (the tide amplitude is only a few centimetres) although once or twice a year a storm surge can temporarily raise the level by 1-2m. For all these reasons, the conditions close to the water are very different from those in a similar position on a British coast.

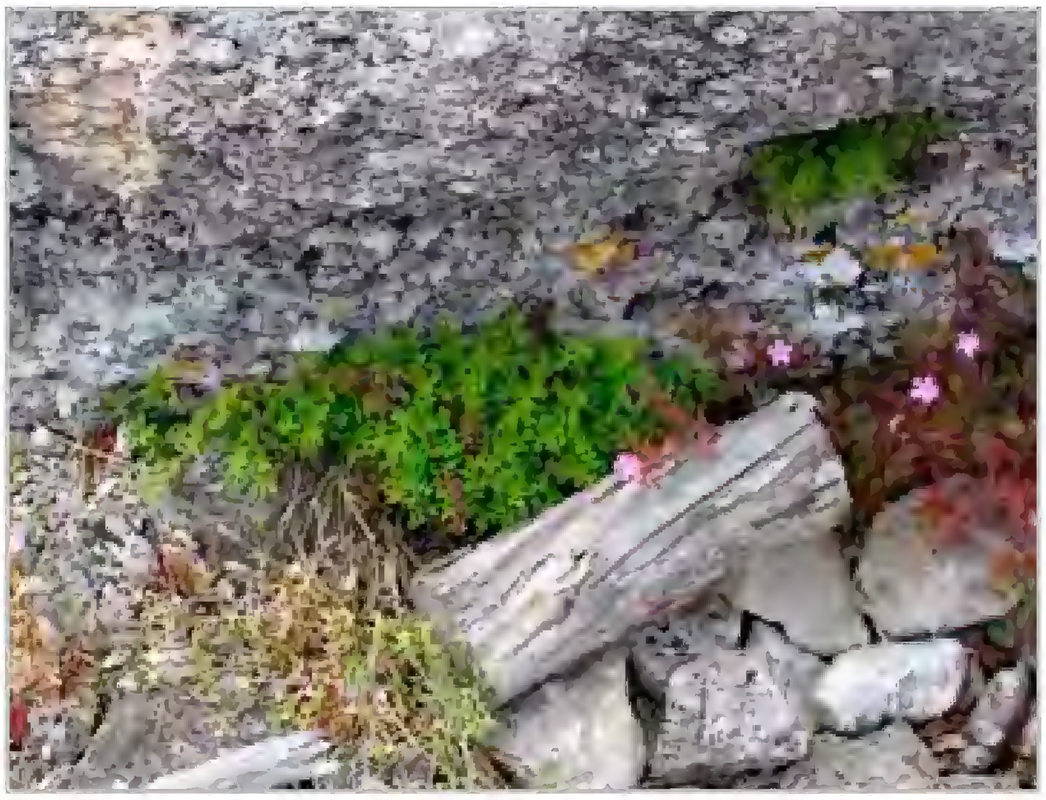

Fig. 3. *Asplenium ruta-muraria* on the eroded limestone outcrop shown in the foreground of Fig.2 (June, 2014)

The Beach Fern on Fårö grows in cracks on the sides of eroded limestone outcrops along the shore (Figs.2 & 3). This erosion took place when the sea level was higher. More surprisingly, it also grows on the ground among the small fragments of limestone rubble that form the beach (Fig.4). Judging by their size, some of these plants are of considerable age, reflecting not only the suitability but also the long-term stability of their habitat. ❐

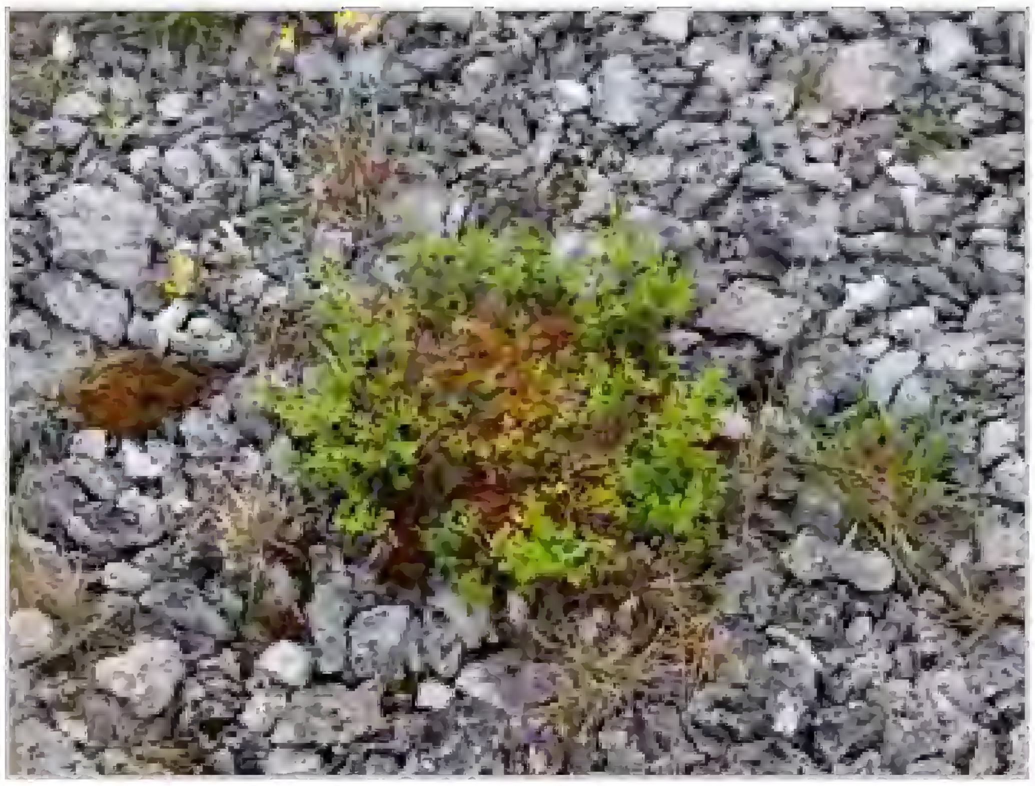

Fig. 4. *Asplenium ruta-muraria* growing on the limestone rubble forming the beach close to the outcrop in Fig.2 (June, 2014)

An Amazing Ball Game

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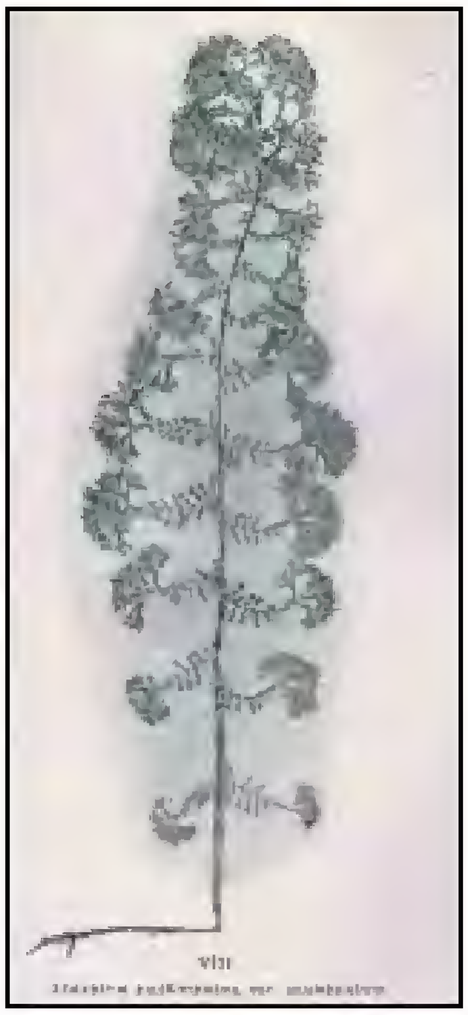
As an avid cultivar collector I am always on the look out for that “special” one. For many years I have been looking for the *Athyrium filix-femina* ‘Gemmatum/Glomeratum Group.’

Searching for definitions, we find that J.W. Dyce in his book *Fern names and their Meanings* offers the following.

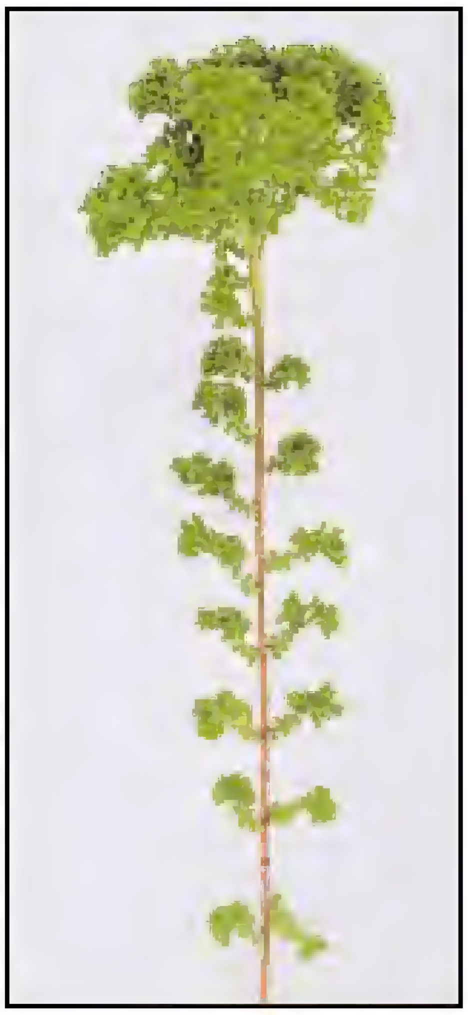
Glomeratum: “having a dense rounded terminal crest”
Gemmatum: “provided with buds, budded”

The *Fern Gazette,* 1919, gives the following in its glossary of terms:
Gemmatum: “decked with gems”

They all sound very interesting and I am sure you will understand why I have been fascinated by these cultivars for a very long time. The *Fern Gazette’s “decked with gems”*, in particular, is very intriguing. It certainly sounds like a jewel of a fern.



Athyrium filix-femina ‘Glomeratum’
(photo taken from British Ferns and their Varieties, C.T. Druery, 1910



Athyrium filix-femina ‘Gemmatum Bolton.’
(photo © M. Rickard)

Searching for records of this cultivar group of ferns provided the following results.

Some History

The first record I can find of a plant that looks like these is

A Glomeratum raised by Mr Ivery of Dorking in 1864. The height was between 35-40cm (14-18ins) tall 125mm (5ins) wide. It was sold for 2s 6d in 1890 from Birkenhead and listed by E. J. Lowe as a Grandiceps section (crest wider than frond 1891). Martin Rickard says that this is no longer in cultivation .

Then ‘Gemmatum Barnes*’,* 68cm x12.5cm (27x5ins), 1891. E. J. Lowe *Young Collector* series as a Cristatum section.

It is also mentioned in the *Fern Gazette* as follows.

In 1929 a display of ferns by Mr Joseph Lloyd of Southport contained *A. f.-f.* ‘Gemmatum Barnes’*.*

Mr Robert Bolton displayed in 1930 a *A. f.- f.*‘Gemmatum’ with depauperate stems (means impoverished lacking in parts) and tremendous heavy crests. Could this be the ‘Gemmatum Bolton’ we know today?

On the 17th of August 1937 Mr Robert Bolton showed at the RHS an outstanding plant of *Gemmatum* “and a number of seedlings of *Athyrium f.- f.gemmatum*”

1938 Mr Garnett's collection in Windermere had a flourishing specimen.

A. J. Macself 1952 says the original plant was raised by Mr J.M. Barnes and one named Bolton is particularly good.

Summarising the collective opinions of A. J. Macself, Martin Rickard and Reginald Kaye we learn the following.

Basically they vary a lot if grown from spore. Very few remain in character. They remain scarce and to get good plants they are best from division.

I vaguely remember seeing one on the rockery at Wisley years ago, but 2014 proved to be very fruitful. This year I visited the national collection of *Athyrium filix-femina* held by Nick Schroder and there was the form ‘Gemmatum Barnes*’* (Fig.1) with green stems. A trip to Cumbria later in the year yielded the same cultivar at Sizergh Castle and again at the Bolton collection (Fig.2). Like buses you wait ages to see one, then you see three!

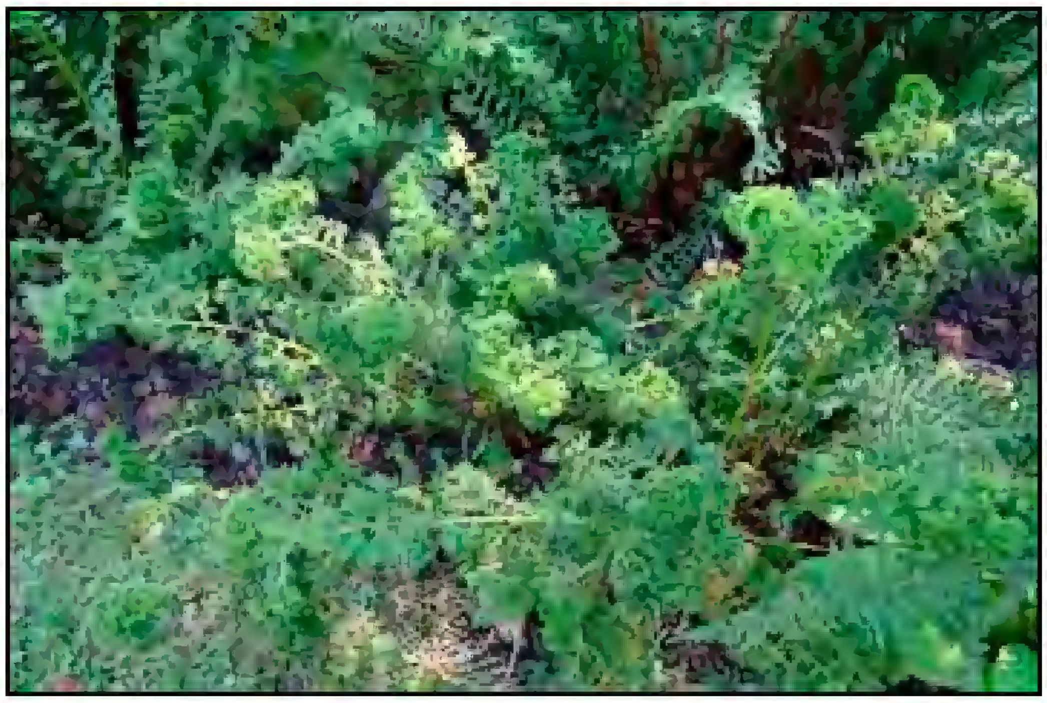


Fig. 1. *Athyrium filix-femina* ‘Gemmatum Barnes*’* in the national collection of *Athyrium filix-femina* held by Nick Schroder

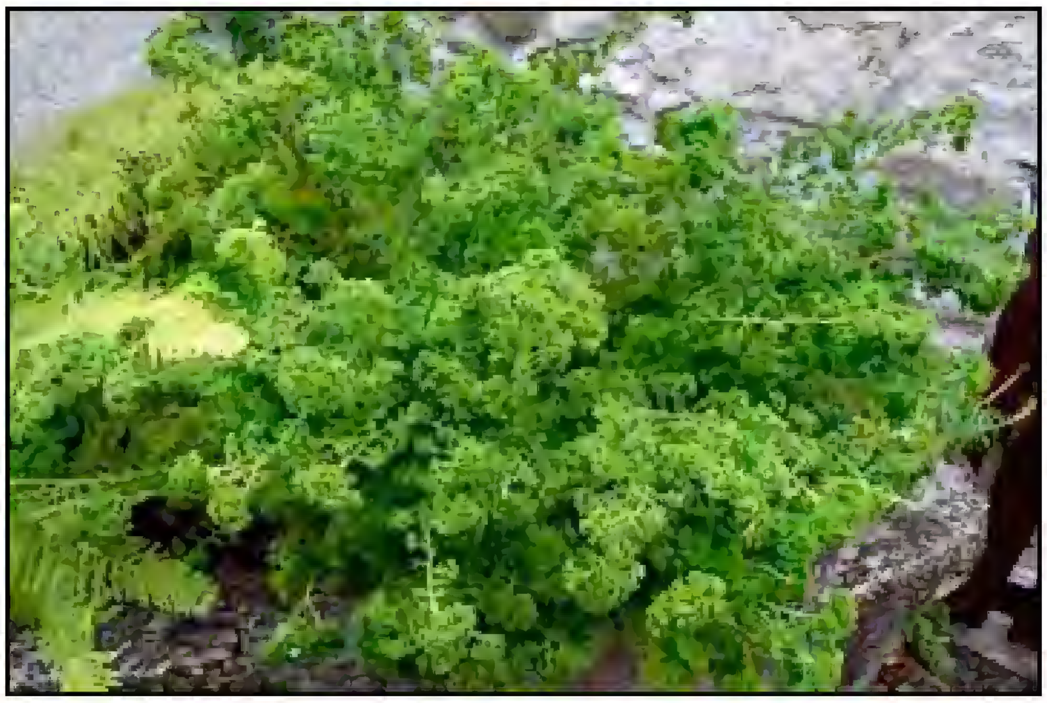


Fig. 2. *Athyrium filix-femina* ‘Gemmatum Barnes*’* in the Bolton collection at Warton, Lancashire

An Amazing Ball Game

During my visit to Sizergh Castle I also saw the stunning 'Gemmatum Bolton' (Fig.3). This is the the red stemmed form. It was a magnificent specimen and almost took my breath away. It stunned me so much that I didn't spot 'Gemmatum Barnes' lurking behind this fern until I went back for a second look.

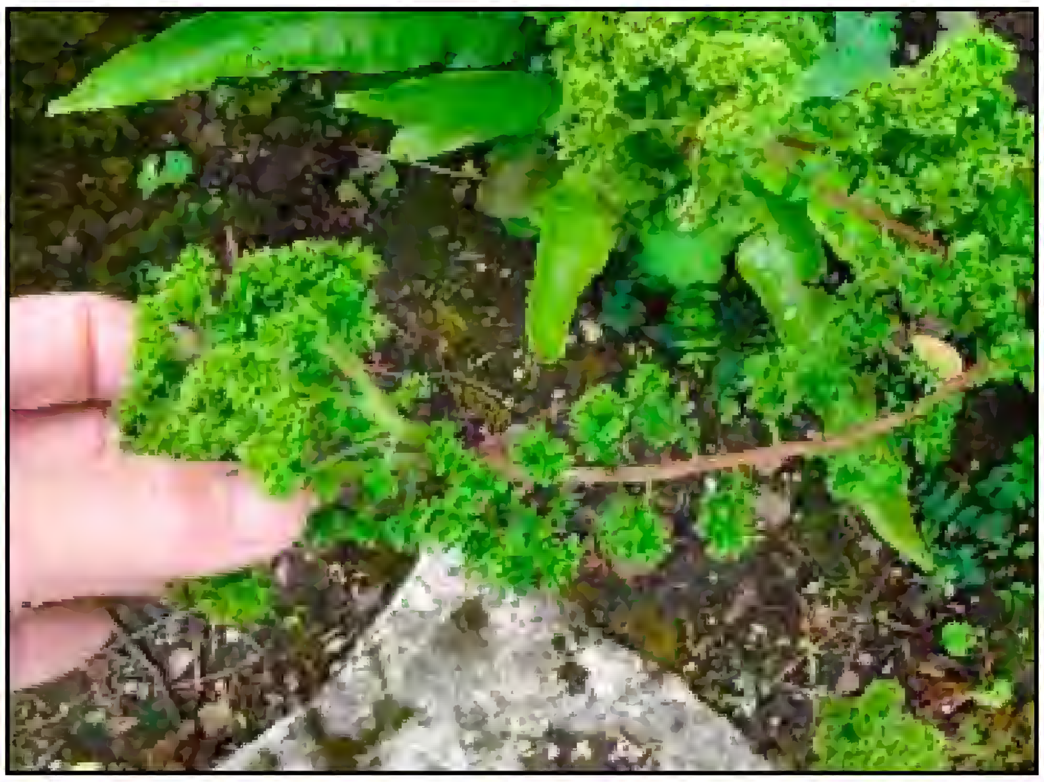


Fig. 3. *Athyrium filix-femina* 'Gemmatum Bolton' seen at Sizergh Castle, note the red stem

And finally we have this beauty from John Edgington found in Scotland under a boulder near Moulzie Burn in Glen Cova on the 9th September 2010 (Figs.4 & 5). All plants in circulation are divisions of the original plant so are a single clone. It is magnificent. On measuring the longest frond it was 76 cm long or in old English 30 ins, with stunning tight balls all the way up the stem, and fully formed pinnules at the base but becoming depauperate as you go higher up the frond, just leaving gems of crests on the tips. John very kindly gave me a young plant of this fern in 2011. It will always be treasured.

What a find and worthy of a name. Talking to John he suggested we call it *Athyrium filix-femina* (Gemmatum Group) *'Moulzie Burn.'*

I have heard recently from Mat Bishop that he has found a Glomeratum/Gemmatum but he does not have a picture of it at present.

It is amazing what is out there so keep looking, you never know what you will find under a boulder! ❒

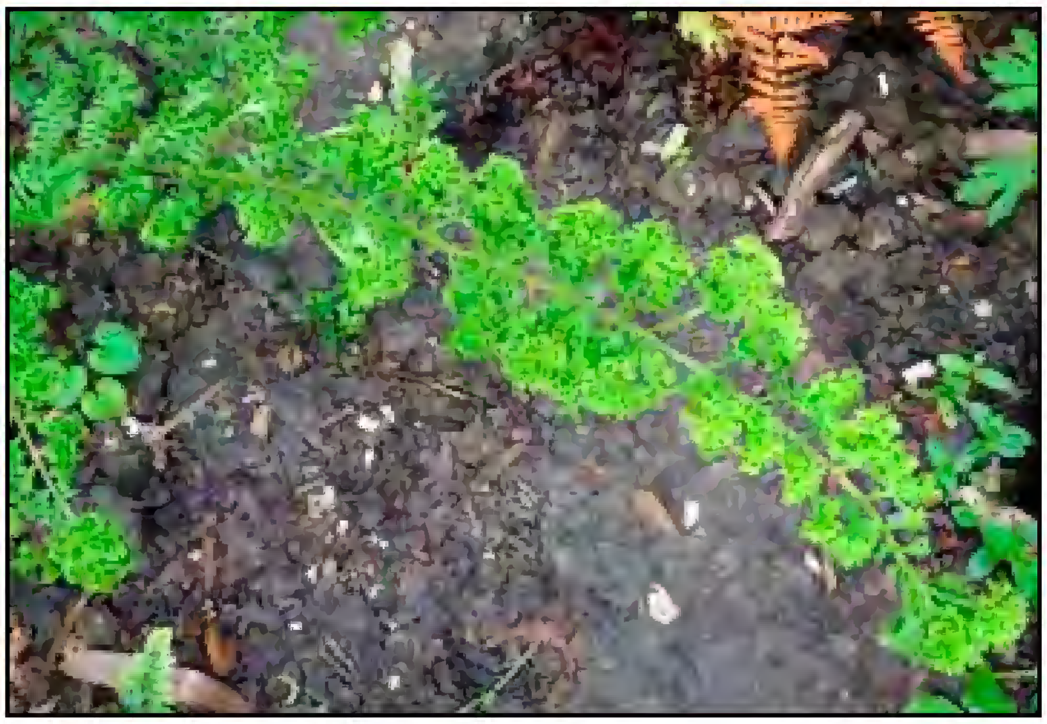


Fig. 4. Detail of the *Athyrium filix-femina* (Gemmatum Group) 'Moulzie Burn' showing how it is "decked with gems"

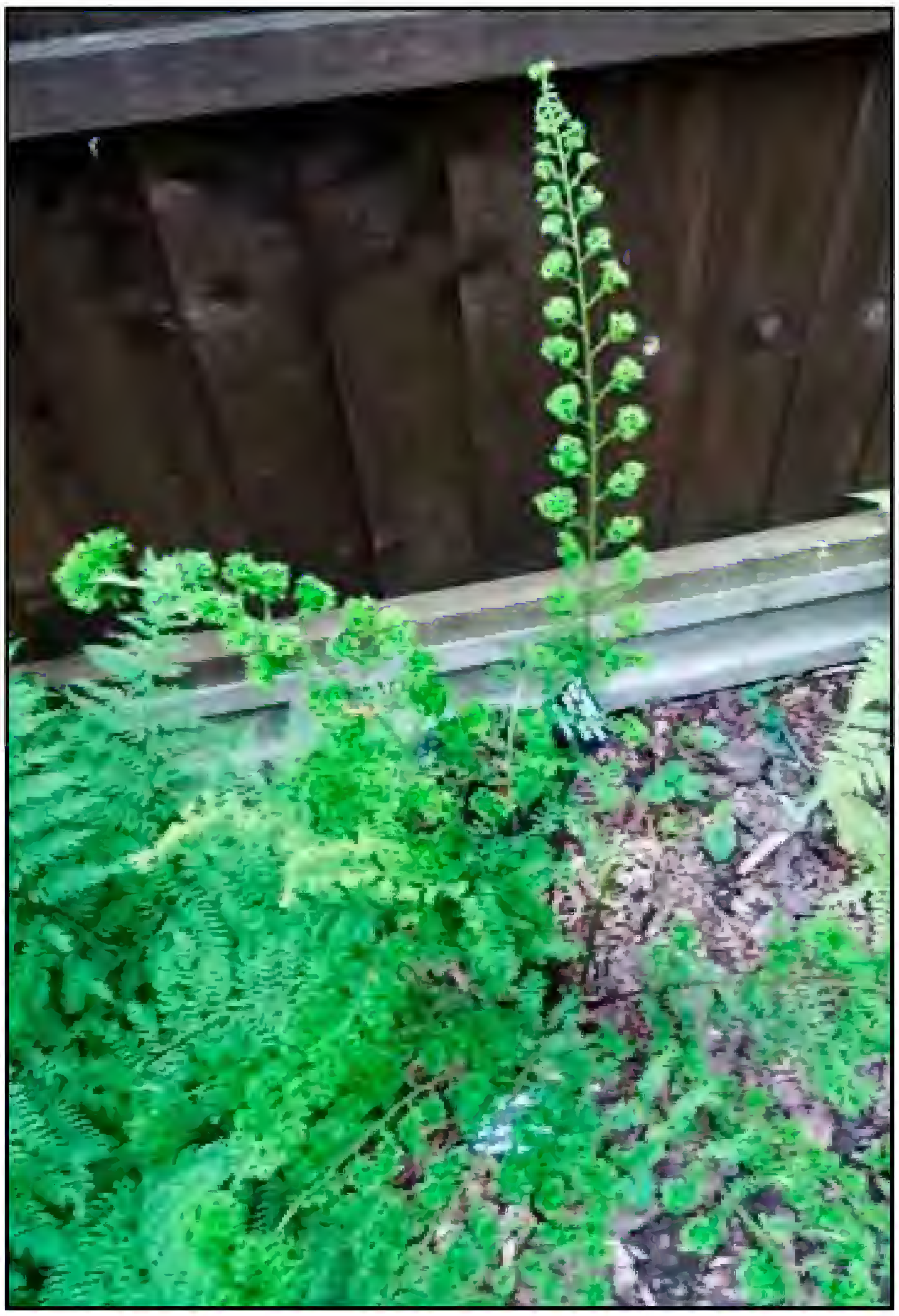


Fig. 5. *Athyrium filix-femina* (Gemmatum Group) 'Moulzie Burn' found by John Edgington under a boulder in Glen Cova

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Polystichum tsus-simense in the terrarium

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Ferns have always held a fascination for me, in particular the fine intricate fronds of *Polystichum* species. As a plantsman and writer on plant propagation, I undertook some research on fern propagation from bulbils and division. Thumbing through my antiquarian fern books one of the most informative proves to be Reginald Kaye, *Hardy Ferns*,1968. The chapters on hybridization and cultivation, and cultivating ferns in the open are an invaluable source of reference for future propagation. Another very interesting reference source is *Ferns and Fern Culture*, there is no date in this old book. Some brief research tells me it is likely to date around the 1910's. An interesting feature on the hardback cover are the words PRICE ONE SHILLING, these are positioned under a fern illustration. The book was written by J. Birkenhead(F.R.H.S) and revised by F. Parsons. It is a third edition.

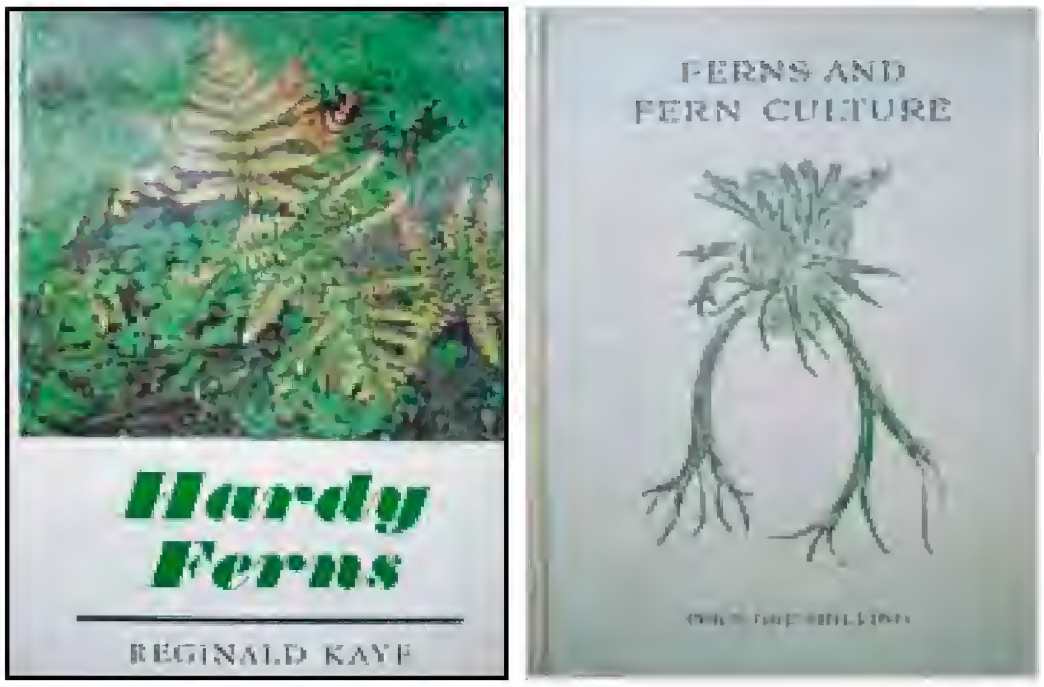

Fig. 1. (left) *Hardy Ferns* by Reginald Kaye and (right) *Ferns and Fern Culture* by J. Birkenhead used as references for fern propagation, they are invaluable for the fern grower

On February 8th 2014 I attempted the division of a *Polystichum tsus-simense*. At the time of undertaking this division I had not planned this article, hence no images of the process. *Polystichum tsus-simense* is also known as the Holly Fern or Korean Rock Fern. This species is evergreen/ semi evergreen, 30-45 cm and hardy in USDA zones 6 -9. The fern is apogamous - producing a sporophyte directly from a prothallus without sexual fertilization.

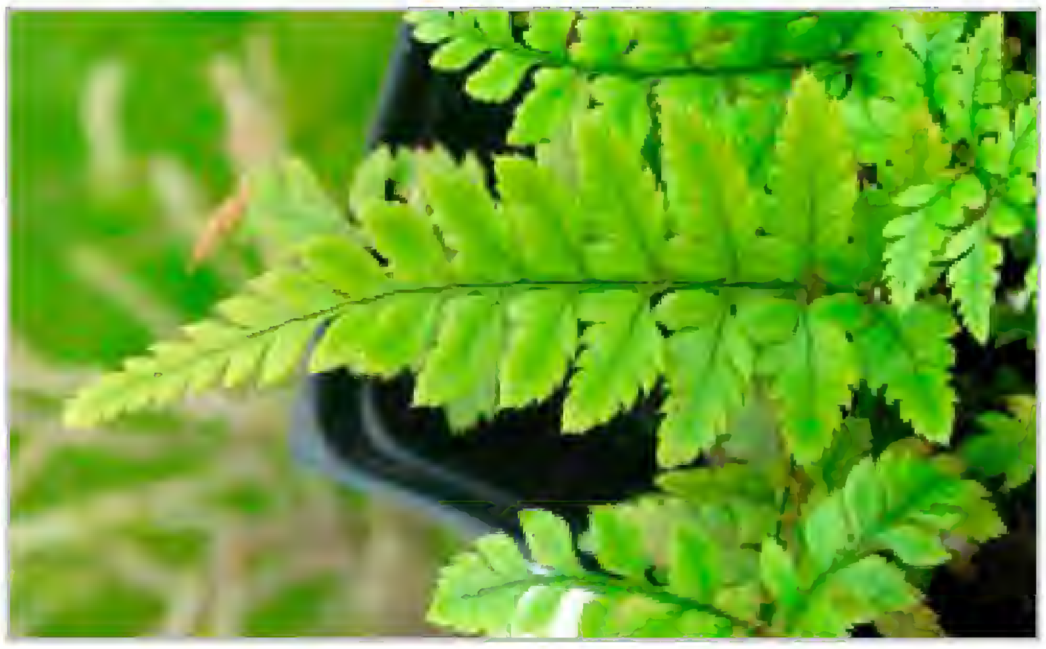

Fig. 2. *Polystichum tsus-simense* showing the bipinnate fronds with dark veins. A very elegant fern that is often used for floristry

The rhizome of this species is erect. Grooved stipes with dark brownish black scales are about a third of the frond length. The blades of fronds are lanceolate, bipinnate, black-green in colour with dark veins. Between fifteen and twenty pairs of pinnae support spine-tipped pinnules, these are separate with a short stalk. Sori with peltate indusia are medial. (Olsen 2007)

Fig. 3. The polystichum was purchased in a 1 litre plastic pot

The habitat and range for this species are forests and rocky slopes in China, Korea, Japan and Thailand. The species is also ideal as a low maintenance fern for indoor

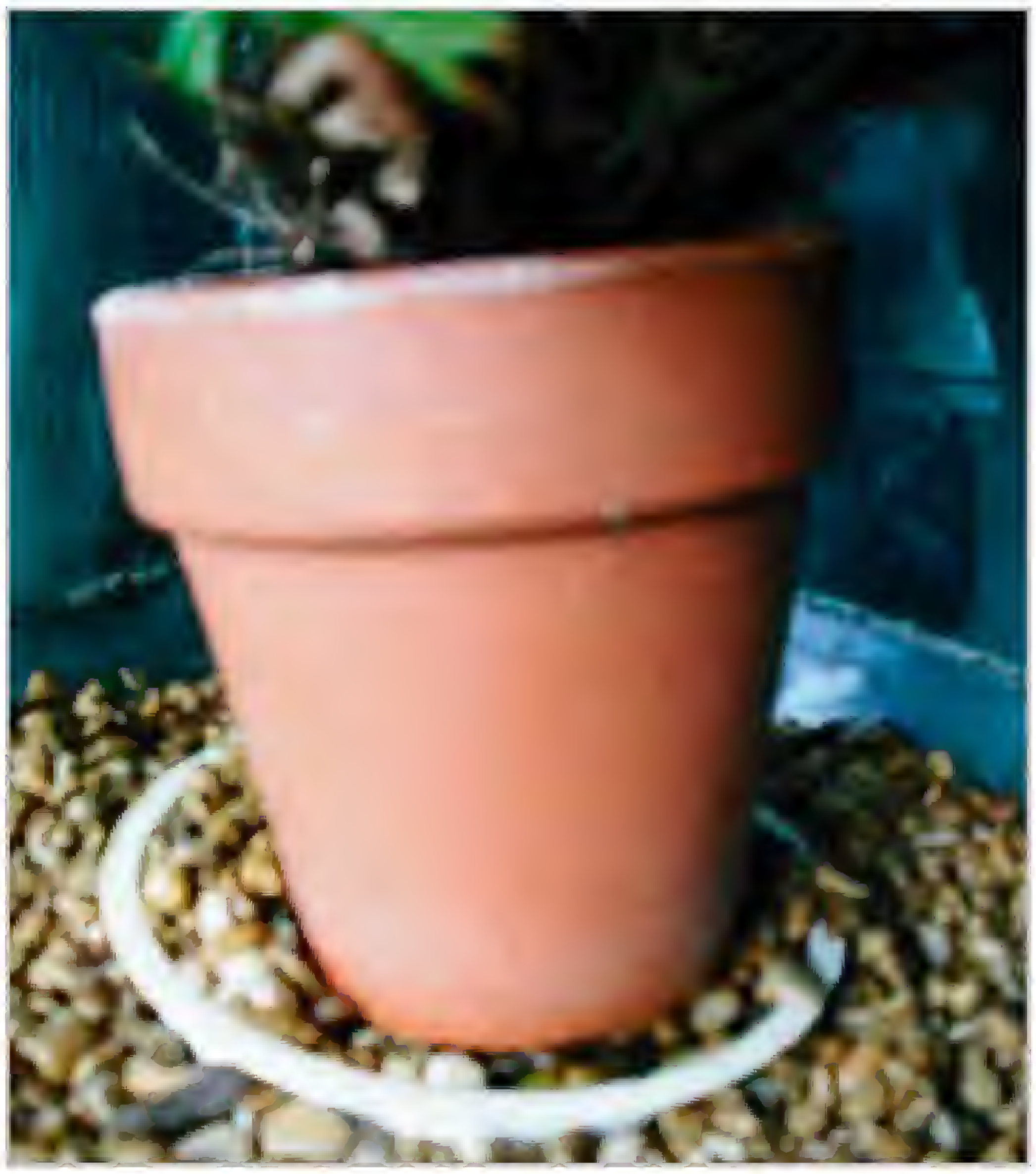

Fig. 4. Re-potted into the smaller 4cm clay pot

culture. *Polystichum tsus-simense* is a sister species to *Polystichum luctuosum*. The pinnules on *luctuosum* are attached to the pinnae rather than being separated as is the case with *tsus-simense*.

This particular species of fern is ideal for growing as a border edge fern in a shady perennial border. It is also widely used in North America as an addition to floristry. *Polystichum tsus-simense* has a neat compact habit. This semi evergreen fern can also be grown in patio containers to enhance the aesthetic value of a shady courtyard space.

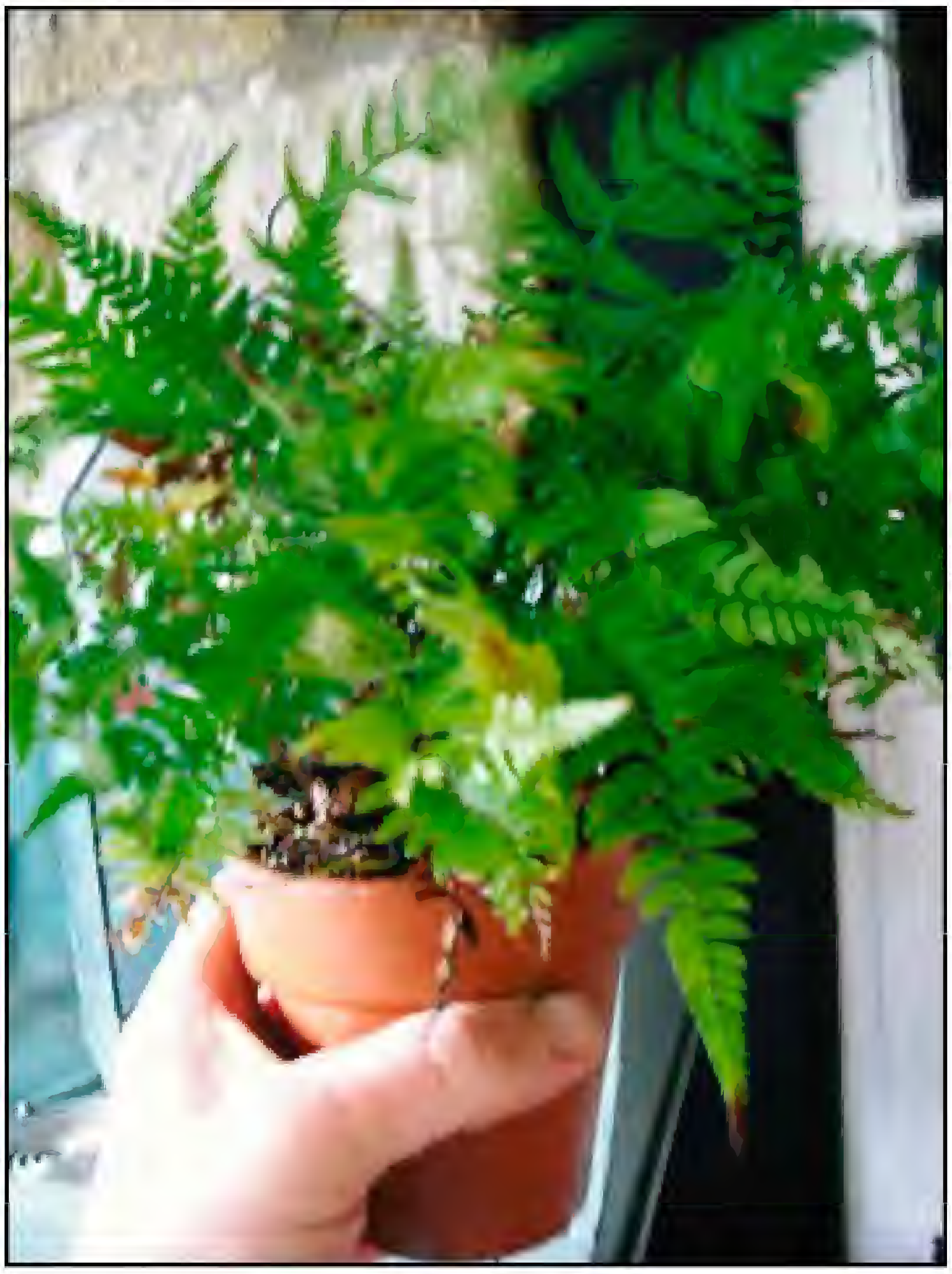

Fig. 5. The fern increases its growth rate

The polystichum was purchased in a 1 litre plastic pot. The objective was to re-pot half of the fern in a small 4cm clay pot and position it within a terrarium. The terrarium was placed on an outside bench under a porch facing south west.

It became obvious to me as I undertook the process of re-potting that I would be unable to divide the small base of the fern. As an alternative, two thirds of the rooting area was removed to the core of the roots. The mix for re-potting comprised 50/50 leaf mould and a standard peat free potting compost. Because of the small area of the 4cm clay pot a minimal amount of mix was required.

The polystichum sulked for the first month, even with applications of a trickle of water each day within the pot. The small clay pot was positioned on some horticultural grit, the grit was kept moist to allow water uptake from beneath. The fronds looked tired and unhappy with some browning on the tips.

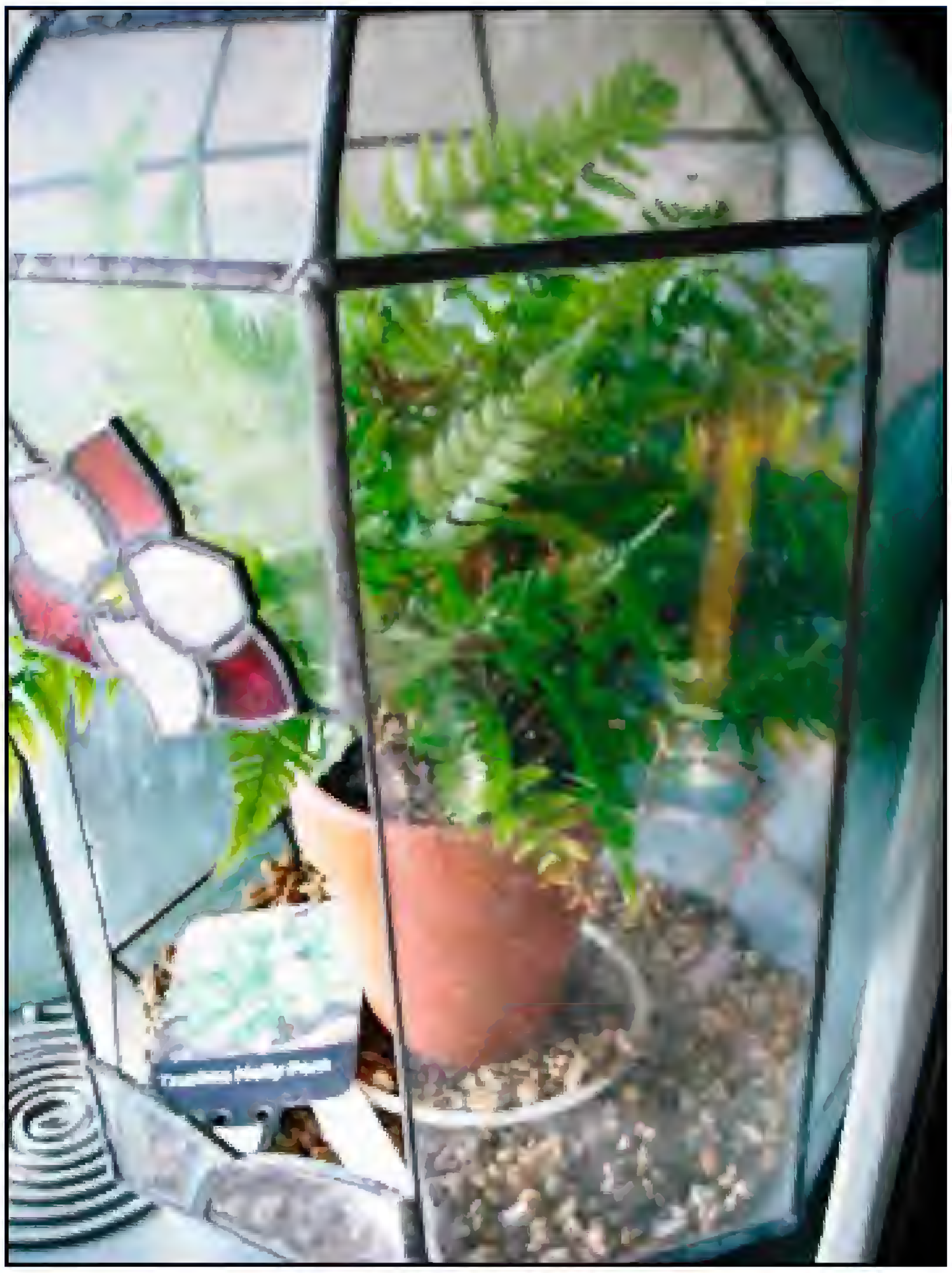

Fig. 6. A layer of moist grit increases humidity and provides water uptake

After a period of about six weeks the fronds started to lift and regain turgidity. From a period of two months there appeared a slight extension in tip growth of the fronds. The fern continued to thrive from this point on. The warm summer of 2014 was a real test of survival in the 4cm pot with a minimal root system. A trickle of water was added regularly to the pot. On particularly hot days the fern was sprayed with a mist of water to reduce the rate of transpiration. As a back up, a small layer of green shade netting was placed over the terrarium to reduce the greenhouse effect from the heat. The terrarium is open fronted to allow for air circulation.

Since the initial transition from the 1 litre plastic pot to the 4cm small clay pot, the fern has easily doubled in size, despite the substantial removal of roots.The polystichum has had to be clipped back on several occasions to keep it freely housed in the terrarium.

The first full season's re-growth has proved to have been an interesting experiment in response to minimising the root system. This is a useful platform for ongoing fern propagation and cultivation ❐

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TENERAL FLATTENED FLABBY FERN FRONDS FOLLOW FOLDED FIDDLEHEADS

From *Fiddlehead Forum*, 1989, 16/(2):10 (with permission from the American Fern Society)

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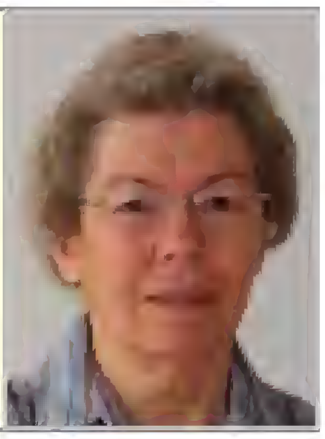

For years I have been looking for an appropriate term to describe the fern frond at the time that the fiddlehead has opened up and expanded the blade, but the blade, even when it reaches full size, is still soft and immature. This is the important stage before the blade becomes mature. The leaf tissues are still delicate, the cells still not completely differentiated and examples collected at this time make terrible herbarium specimens and fern show displays. This is also the stage at the end of which reduction division begins to take place in the sporangia and the first spores begin their formation. I have heard this stage referred to as the "immature frond" stage, but that phrase could be applied just as well to the fiddlehead.

Actually the very earliest stage of the frond is called a leaf primordium, but it is so small (merely a tiny, rounded projection in the bud) that it is hardly noticeable, and it also tends to be thoroughly hidden by masses of hairs or scales. The regular fiddlehead (also called, inappropriately in my opinion, the crosier) is the stage of growth characterized by the tip being rolled up around the young leaf apex at the center. In typical ferns, this type of development, called circinate (from the Greek word for circle), is found only at the tip of the whole frond if it is simple or at the tip of the frond and also at the tips of the lateral pinnae if it is compound. In grapeferns and moonworts (Botrychium) and adder's-tongues (Ophioglossum), typical fiddleheads are not formed, and in certain cheilanthoid ferns the circinate type of development is often much modified.

What follows the fiddlehead and precedes the fully mature frond is a stage that looks essentially like a mature frond or mature fronds with somewhat smaller than usual pinnae that have not yet reached their full size, even though they are more or less flattened like mature pinnae. Just because the blade has reached its full size and shape does not mean that it is mature. This stage lasts only for a period of a few days to a week or two, depending on the species and the size of its frond. It can be recognized as not mature often at a distance because of its usually shiny pale yellowish or whitish green color. However, in many temperate ferns, all of the new fronds arise at approximately the same time. Some ferns (like Dryopteris and Polystichum) may develop "late leaves," isolated fronds that come up as late as June or July, usually the result of browsing or trampling by deer or cattle.

What can we call the second stage of development? Some suggestions are "post-circinate immature frond" or "premature non-circinate frond" or "mature frond just out of the fiddlehead state" or "mature frond that is not mature yet." Being a lepidopteridologist (a person who studies both butterflies and ferns), I realized that there is a perfecty logical adjective that can be used. I got this idea from my student, Brian Scholtens. The word is "teneral." Teneral refers to the condition of an insect after molting, during which it is still soft, and often of different color from the later, hardened stage. The most familiar example to most people is the butterfly's wings after its emergence from the pupa. The wings are still soft and even floppy, and at first they are smaller than in the final stage. Depending on the species and size, the maturation of the wings takes from a few minutes (certain lycaenids) to a half-hour or more (certain swallowtails). In this stage, before the wings harden, the insect is vulnerable because the wings are too weak for flight. The wing structures need to mature and become stiff. It seems to me that the word "teneral" can be used for fern fronds as an analogy to the stretched-out butterfly wings after their pupal stage.

We can compare the fiddlehead stage of a fern frond with its teneral stage and the fully mature stage as follows: (1) Fiddlehead with rolled tip characteristic of the fiddlehead stage and mature stages: (2) texture — soft and succulent in the fiddlehead and teneral stages, but hard, papery or leathery in the mature stages; (3) color – teneral blade pale green, yellowish or whitish (often reddish or purplish in teneral Adiantum and red, orange, or yellow in teneral blechnoids of various genera); (4) luster – fiddlehead, where exposed, shiny, teneral shiny, mature frond duller; (5) vulnerability – readily damaged by overheating, direct sunlight, steaming, drought, cold shock, and certain insects in the fiddlehead and teneral stages, but more resistant in the mature stage; (6) scales and hairs – commonly abundant in the fiddlehead stage, less common in the teneral, and sparse or absent in the mature stage; and (7) mature spore production – absent in the fiddlehead, only immature sporangia in the late teneral; and mature spores only in the mature fronds.

A caveat must be made to collectors and exhibitors. Although teneral fronds may seem normal, they are strongly susceptible to stresses, including wilting, that affect the mature fronds only slightly or not at all. Teneral fronds commonly make poor specimens. This can be a real problem for North American collectors carrying out their field work in the spring. The tissues of teneral fronds (including epidermis and mesophyll) are so delicate and undifferentiated as to make the pressed and dried specimens often translucent like onionskin paper, or even transparent. Drying specimens still in the press are hard to rearrange once they have folded over. A living plant, or living frond taken to a fern display or fern show, if still in the teneral stage, is readily subject to wilting or burning from cold or heat or lack of water. It is much better to take a plant or frond in which the blade tissues are fully mature.

Unless someone comes up with a better or prior word for this stage of the fern leaf, I suggest that we use teneral. If you cannot find the word in your abridged dictionary, try the unabridged. Use the word three times in a sentence and it is your forever. And to make it easy for you to remember, use the simple mnemonic: "Teneral flattened flabby fern fronds follow folded fiddleheads." ❐

NOTE

Not knowing the policy in transcribing American texts for use in an English journal, I have transcribed the text as it is given in *Fiddlehead Forum*, for example leaving taxa names underlined rather than transcribing in italics; leaving words spelt with a 'z' when we might use an 's'; leaving the closing marks of quotation marks outside a full stop or comma; and retaining American spellings, e.g. color.

Cultivar Country - Part 1

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In the summer of 2014 I had the privilege of staying with the *Pteridologist* editor, Alec Greening, and his wife Linda, at their house in the southern Lake District. This area is the birthplace of the society and together we explored many gardens, private and public, locally and further afield in Lancashire. There was even time to locate *Dryopteris submontana* on the nearby fell, which was a first for me.

Alec and LInda have a lovely garden in a rural setting, surrounded by woods and fields. I often crept away to a patio to soak in the peace and calmness of this delightful area. The garden is open to the public with The National Gardens Scheme and is full of many rare and unusual plants. *Salix magnifica* caught my eye with its wonderful glaucous foliage. It looks very like a Magnolia until it flowers.

However we are not here to talk about flowers.

In this article and Part 2 on page 153 I will be describing many fern cultivars and the occasional species seen in the various gardens I visited. I met many members of the BPS who are passionate not just about their ferns but also about meeting other fernaholics.

I personally feel that this area is the home of cultivars, as it would seem that the passion for them has never faded, compared to the south where interest seems to be concentrated on species. Each garden I visited had something special. Some had treasures that I had always wanted to see, some had cultivars that I couldn't even put a name to. They all had wonderful ferns.

The rest of this article will be devoted to ferns found in my host's garden and Part 2 will show the amazing cultivars we came across elsewhere in, what I will regard as, cultivar country.

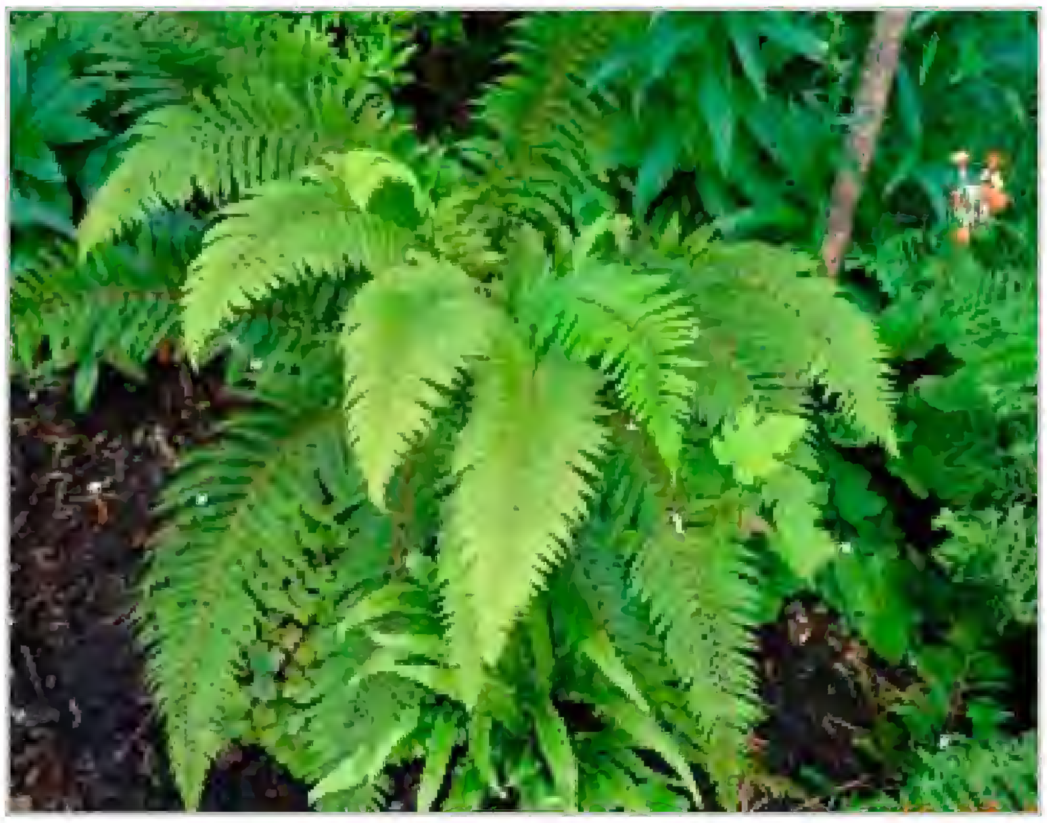

Fig. 1. *Polystichum setiferum* 'Multilobum' (ex Beth Chatto)
(Photo: Alec Greening)

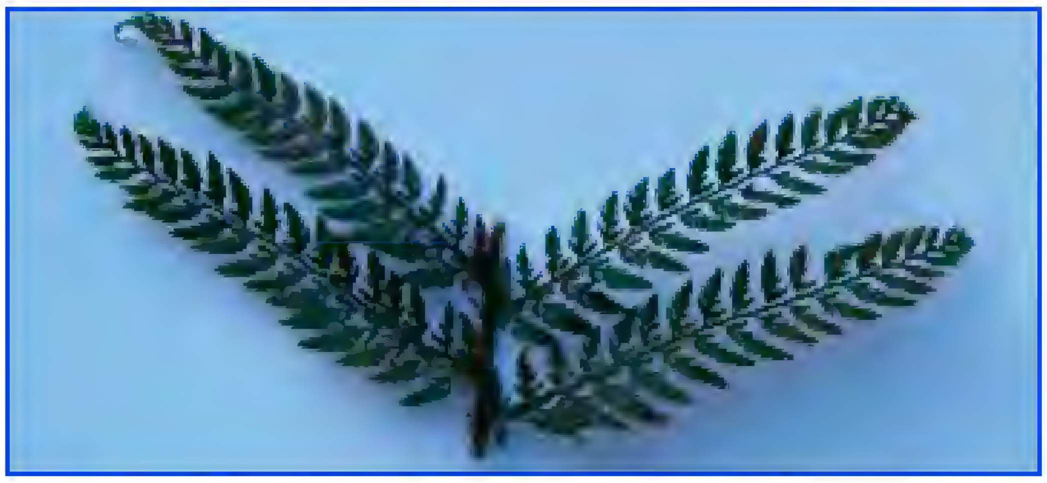

Fig. 2. Pinnae detail of *Polystichum setiferum* 'Multilobum' (ex Beth Chatto)
(Photo: Alec Greening)

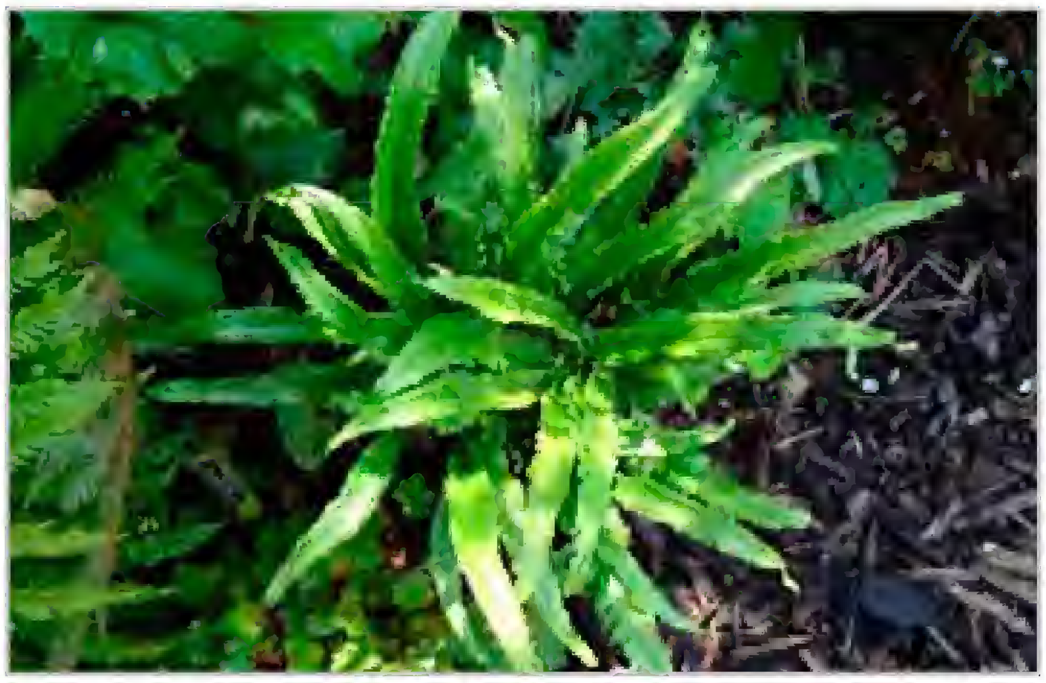

Fig.3. *Asplenium scolopendrium* 'Supra-lineatum'

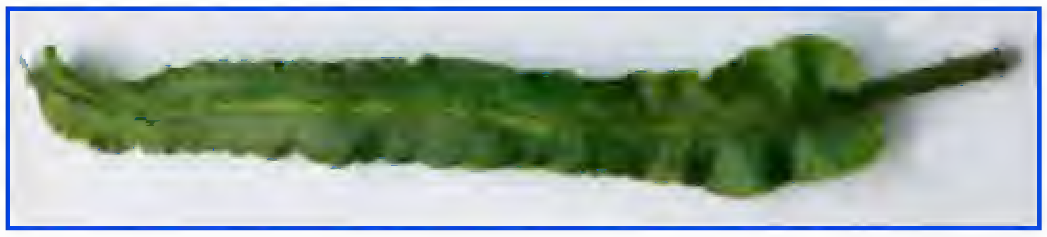

Fig. 4. *Frond detail of Asplenium scolopendrium* 'Supra-lineatum'
(Photo: Alec Greening)

Pear Tree Cottage, Burton-in Kendal. Cumbria. Alec and LInda Greening.

In Fig. 1 we can see this beautiful *Polystichum setiferum* 'Multilobum' (ex Beth Chatto) and the pinnae detail in Fig. 2. It looks almost identical to a variety I know as 'Whiteside'. Both plants are magnificent. (They both came from Long Acre Plants several years ago.) I have only seen two like it and this one is the biggest. It is a gorgeous tripinnate golden beauty, easily grown but seems rare to me. As a young plant it almost looks like a 'Plumoso-multilobum' but changes as it matures.

Just beneath it on one side is a lovely *Asplenium scolopendrium* 'Supra-lineatum' (Fig.3) with parallel lines up the frond, hence the name, lineate on the superior surface or, in English, parallel lines on the upper surface (Fig. 4). A specimen of this plant now lives in the National Collection of *Asplenium Scolopendrium* held by Tim Brock, who gave the name to this fern.

Further up the path was a massive *Polystichum setiferum* 'Smith's Cruciate.' I have seen many plants of this cultivar and they can vary quite a bit but this is a nice form and the biggest I have ever seen (Fig.9). Some fronds are nearly 4 ft long (1.22 metres) and a few of them were showing bulbils being produced. It would be nice to propagate this form and enable others to enjoy owning this fern

Nearby was a more modern variety that at one time, in my naïvety, I thought I would not worry about as I already had *Athyrium nipponicum* 'Applecourt' but how wrong I was. This beauty is *Athyrium* x 'Ocean's Fury' (Fig.4) a superb plant and thanks to Alec I now have it in my collection. It is a plant I would highly recommend and

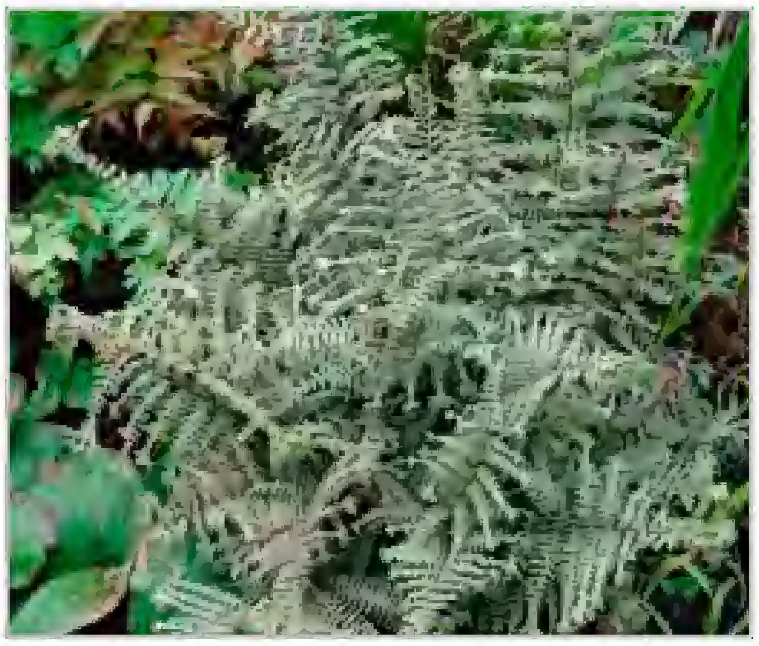

Fig. 5. *Athyrium* x ‘Ocean’s Fury’

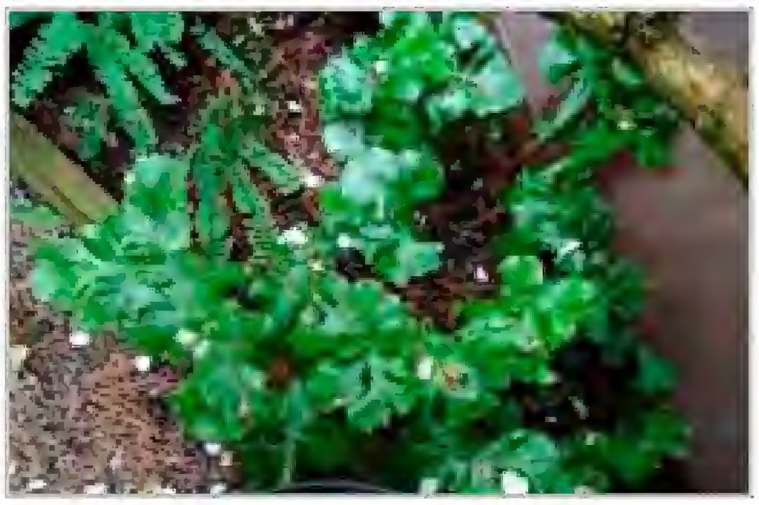

Fig. 6. An unnamed *Asplenium scolopendrium* cultivar

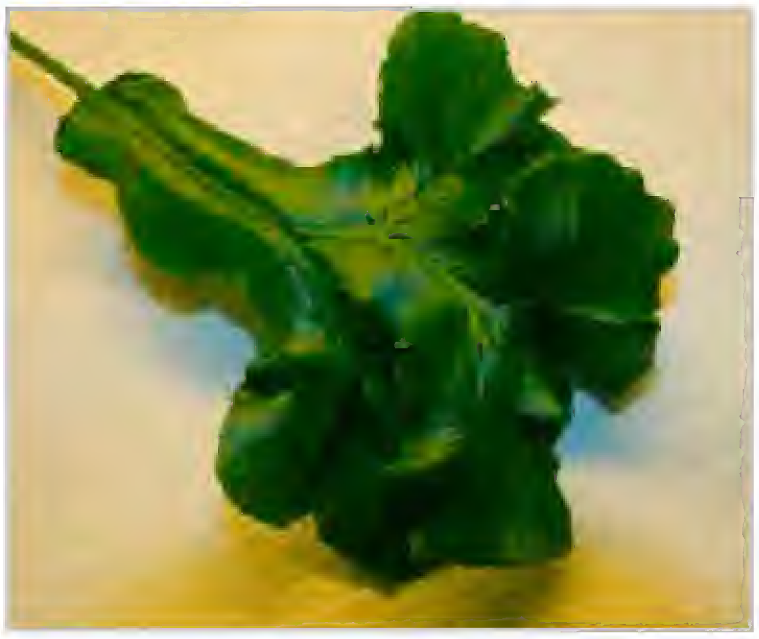

Fig. 7a. Frond detail showing the upper surface of the unnamed *Asplenium scolopendrium* cultivar

(Photo: Alec Greening)

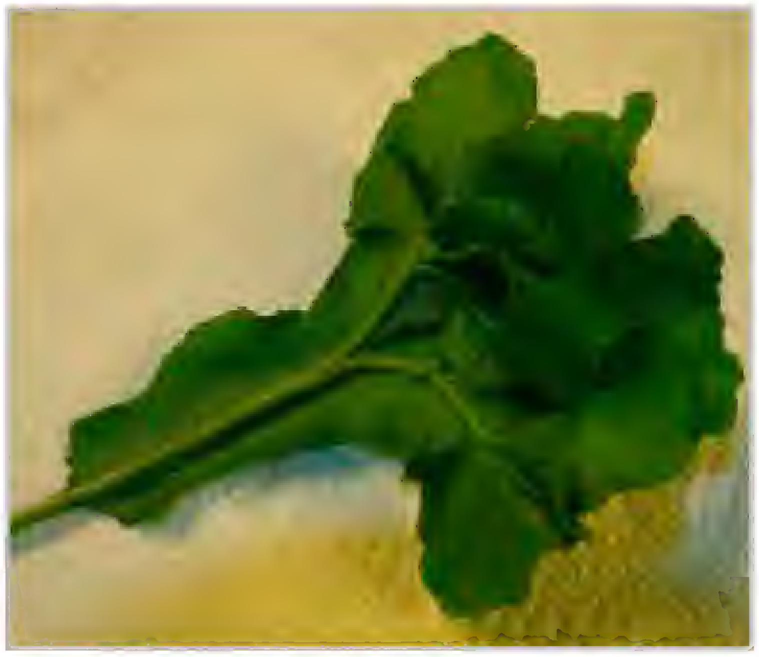

Fig. 7b. Frond detail showing the reverse of the frond of the unnamed *Asplenium scolopendrium* cultivar

(Photo: Alec Greening)

looks great in the combination Alec and Linda have created

Near the greenhouse amongst the various polystichums and adiantums was an unnamed *Asplenium scolopendrium* (Figs.6, 7 & 8) with fascinating foliage. It presents itself beautifully. I am having trouble finding anything that looks like it in Lowe or Druery. I learnt that it was a gift from a retired farmer who got it from his mother’s garden over 70 years ago! His mother, at that time, lived underneath Farleton Knott so it is possible that this plant came from there. Neither Martin Rickard or Tim Brock can put a name to this cultivar but it is suggested that it belongs to the ‘Ramosum Group’.

Another of the beautiful Lady ferns was this *Athyrium filix-femina* ‘Percristatum Group’ (Fig. 8) where the tips of the fronds and pinnules all are crested or have suggestions of cresting

Although this next fern is not a cultivar, *Thelypteris erubescens* (Fig.10) is so choice and elegant that I had to include it. This fern is left out all winter, without protection.

Alec and Linda have a large array of beautiful ferns, some massive like *Dryopteris wallichiana,* and a whole host of different Osmundas growing near a pond in a specially designed bog garden. *Asplenium ceterach,* with fronds over 7" long (18 cms) grows happily in a dry stone wall supported by a mixture that includes limestone dust bought from a local builders merchant.

There are some very choice polystichum cultivars scattered all over the garden, some of which have been rescued from local gardens about to be “made-over.” *Asplenium scolopendrium* cultivars including ‘Crispum Bolton’s Nobile,’ ‘Crispum Moly,’ ‘Kayes Lacerated’ and ’Applecourt’ mix happily with the perennials. Polypodiums include many cultivars discovered in the area and Alec is about to develop a bed he has already called the ‘Cumbria Cultivar Collection.’

I am afraid that I have only briefly mentioned some of the many ferns in this garden, otherwise Part 2 wouldn’t have room for all the rest I found. ❐

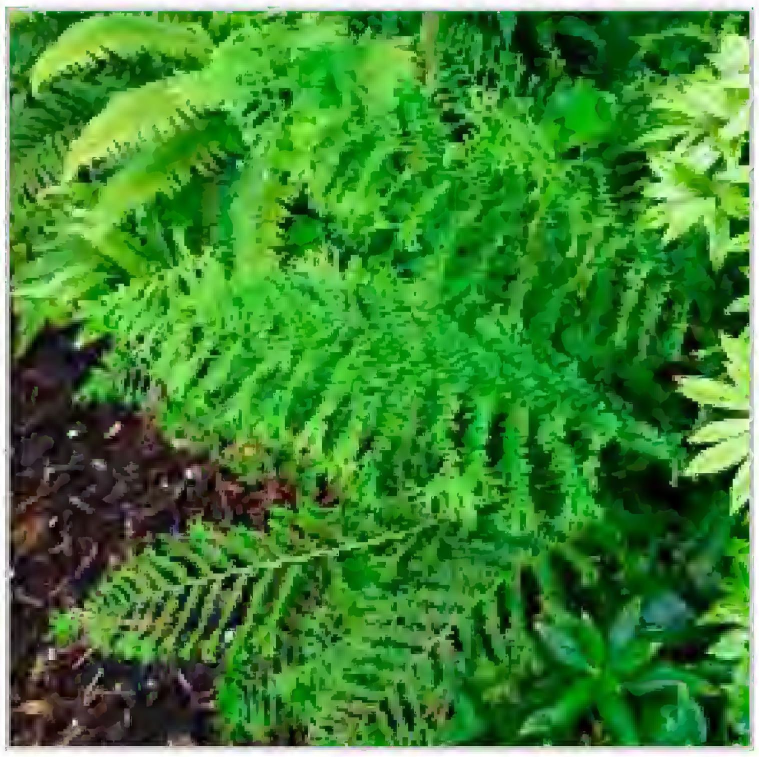

Fig. 8. *Athyrium filix-femina* ‘Percristatum Group’

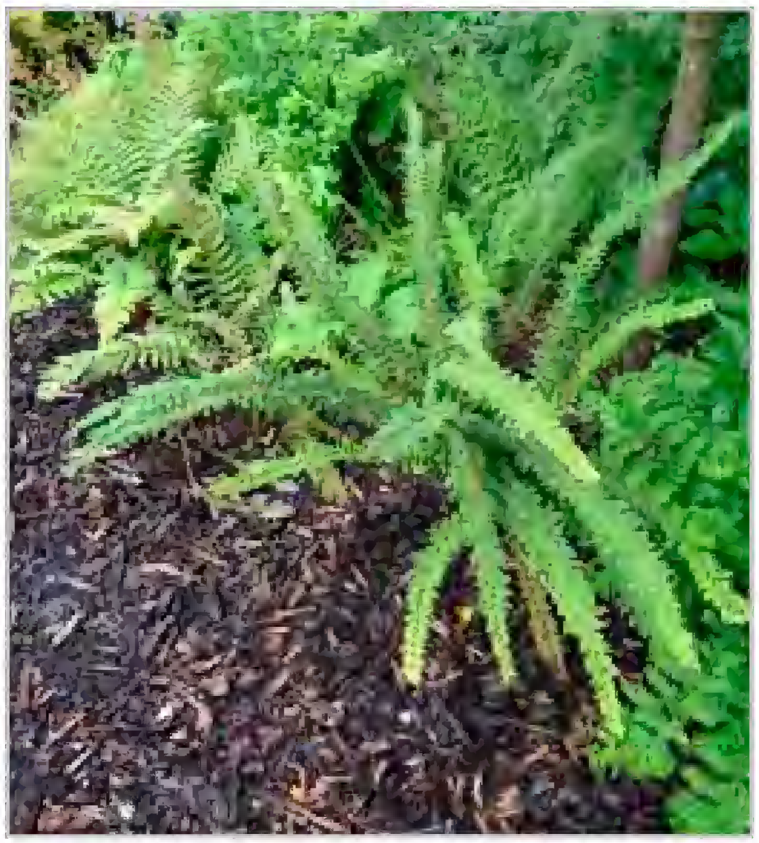

Fig. 9. *Polystichum setiferum* ‘Smith's Cruciate’ with some fronds over 4ft long

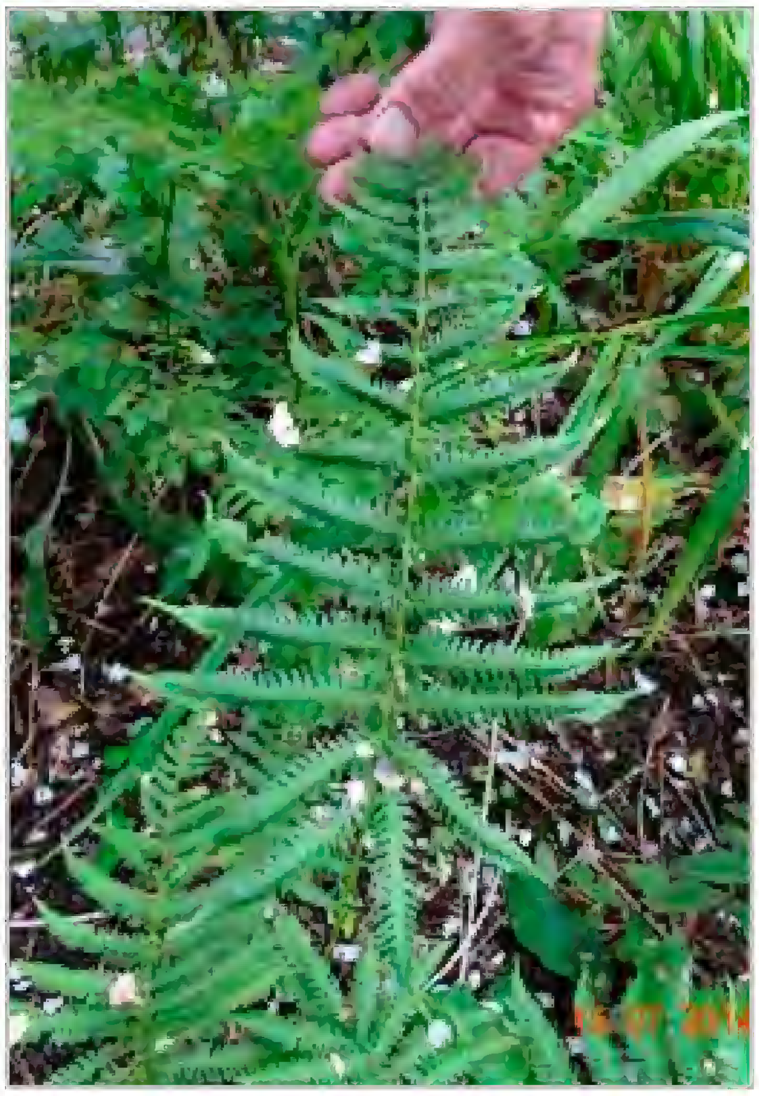

Fig. 10. *Thelypteris erubescens*

Plagiogyria, the Pheasant-tail Fern

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The small genus *Plagiogyria* is the sole member of the family *Plagiogyriaceae*. These ferns have interested me for many years as they superficially closely resemble those species of *Blechnum* with dimorphic fronds. They are now known to be only remotely related and are an interesting example of convergent evolution, where unrelated species take on similar forms due to environmental factors. I do not know if it is significant that Blechnums are often absent or poorly represented where Plagiogyrias are frequent, at least in Eastern Asia. They are almost unknown in cultivation, which is puzzling as they are attractive ferns. I have seen several species growing in the wild and their natural habitat is not unusual. I have always found them on forested mountain slopes in areas of moderate to high rainfall, usually growing with a wide range of other ferns. Several species grow in places that receive low winter temperatures and significant snowfall.

The Japanese name for some of their species is kijino'o-shida, which translates as Pheasant-tail Fern. I think this describes their appearance very well. In this article I will note the species that I have seen in cultivation with the intention raising the profile of these fascinating ferns.

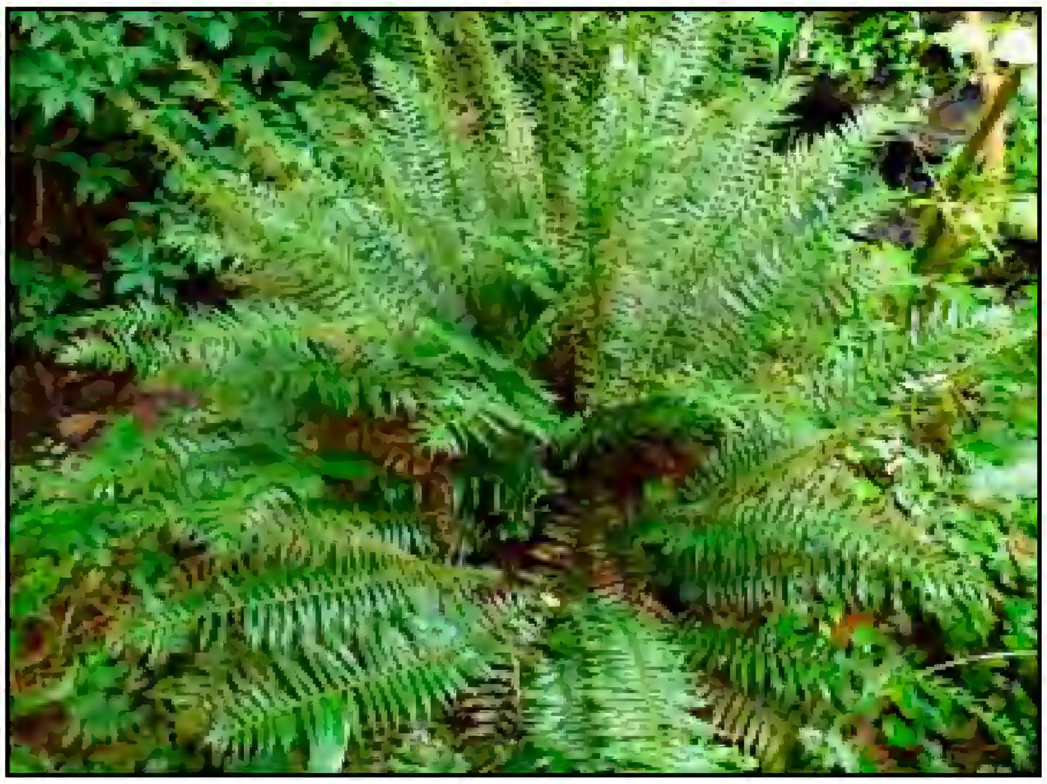

Fig. 1. *Plagiogyria pycnophylla* in a Cornish garden

Taxonomic history

During the 19th century the classification of ferns was still in its infancy. Botanists gradually came to the conclusion that characters such as frond architecture and sorus shape were not reliable guides to natural relationships. Some botanists had clearer insights regarding the importance of characters such sporangia and scale structure than some other, perhaps more illustrious, workers. *Plagiogyria* was first recognised by the German botanist Gustav Kunze as a section of the genus *Lomaria* in 1850. *Lomaria* includes those species now included in *Blechnum* possessing dimorphic fronds. The lamina of the fertile, spore-bearing fronds is reduced to a narrow strip alongside the midrib, giving a skeletonised appearance. These species have been recognised as part of *Blechnum* since the early years of the 20th century. Our native Hard Fern, *Blechnum spicant,* is a typical example. A few years later another German botanist, Georg Mettenius, considered the unique characters of *Plagiogyria* to be sufficiently important to warrant generic rank. These included the presence of aerophores the unusual sporangia that possess an oblique annulus that does not meet the sporangium stalk, these are similar in structure to those found in tree ferns such as *Cyathea* and *Dicksonia* and indeed he positioned his new genus in the family *Cyatheaceae*.

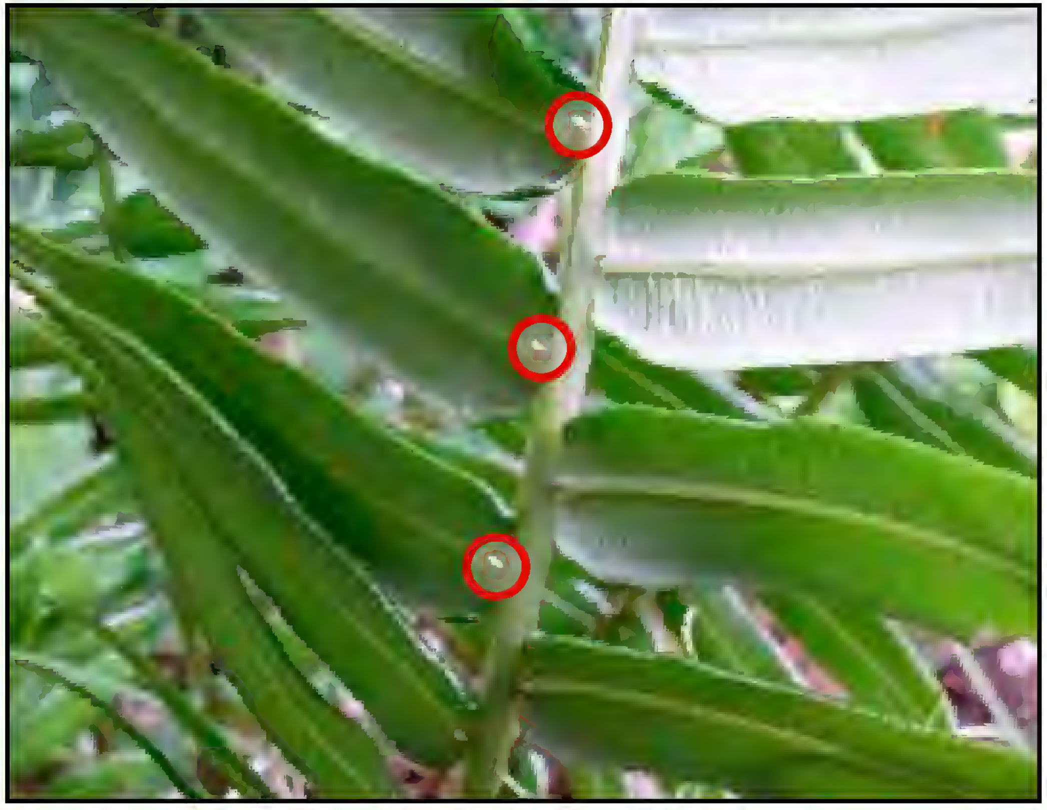

Fig. 2. *Plagiogyria pycnophylla,* frond under-surface showing pale horn-like aerophores (some are circled)

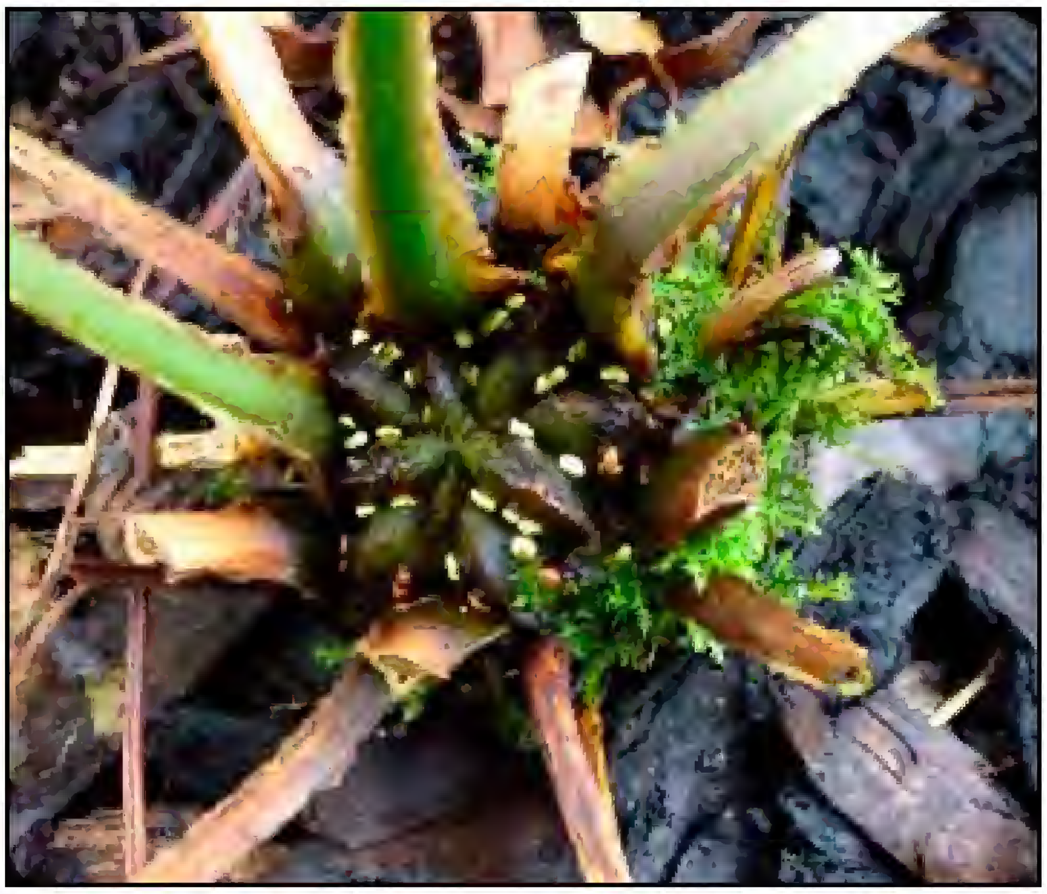

Fig. 3. *Plagiogyria pycnophylla* crown showing naked buds and pale aerophores

Somewhat surprisingly W.J. Hooker in his *Species Filicum* (1860) did not consider these characters to be important and included *Plagiogyria* in *Lomaria* on the basis that it would be inconvenient to separate genera on microscopic differences.

From 1859, as the implications of Charles Darwin's evolutionary theory began to be accepted, attempts at classifications based on descent and natural relationships became more frequent. Increasingly it was realised that anatomical and microscopic characters were more useful in understanding relationships amongst ferns, as, particularly, compared with angiosperms, the range of useful morphological characters was limited. Several botanists saw resemblances to genera related to *Pteris*, but it was Frederick Bower in his important work. The Ferns (Filicales) (1926), who recognised that Mettenius was probably correct and that the unusual sporangium gave important clues to the taxonomic position of *Plagiogyria* and hence they should classified with the more 'primitive' ferns. After reviewing previous classifications he created the family *Plagiogyriaceae* in recognition of its unique characters. Even so, he felt that habit and anatomical features were more similar to *Osmundaceae* and *Schizaeaceae* rather than tree ferns.

It was not until the arrival of molecular studies of DNA in the late 20th century that the true relationship of *Plagiogyria* was confirmed and *Plagiogyriaceae* was positioned firmly with the tree fern families *Cyatheaceae* and *Dicksoniaceae,* along with some other small anomalous families (Hasebe et al. 1994). This has been corroborated by all recent studies and demonstrates that small or obscure characters may be much more indicative of relationships than habit, frond shape or soral arrangement. Most recently Christenhusz & Chase (2014) have presented a very useful and informative review of fern classification. In this paper they propose to reduce the number of fern families by combining several small families into a few larger, more diverse, families. They have therefore included *Plagiogyriaceae* in an enlarged *Cyatheaceae,* which further demonstrates its close relationship. I am not sure that amalgamating these families is particularly helpful and my personal preference is to separate smaller families but I recognise their relationships within Orders. i.e. the Order *Cyatheales* Family *Plagiogyriaceae.*

The character most easily used to separate *Plagiogyria* from *Blechnum* is that of the scales. *Blechnum* species always have scales present on the rhizome apex, croziers and often persisting on the adult fronds. In *Plagiogyria* the rhizome apex and young fronds are naked and scales are always lacking.

Species in cultivation

Kramer (1990) when summarising the known information on *Plagiogyria* mentioned that 40-50 species were then accepted but that this number was too high. The genus was revised by Zhang & Nooteboom (1998) and they reduced the number to 10 Old World species and one species found in the neo-tropics. They found that too many species distinctions were based on morphological expressions caused by environmental and developmental modifications. Their studies of the American species were not as exhaustive as those on the Asiatic species, and American botanists generally consider there are about 3 species in South and Central America (Mickel & Smith 2004). Most of the recognised species are widely distributed and variable. Several species are difficult to separate and further studies may reveal cryptic speciation, as some species contain polyploid series.

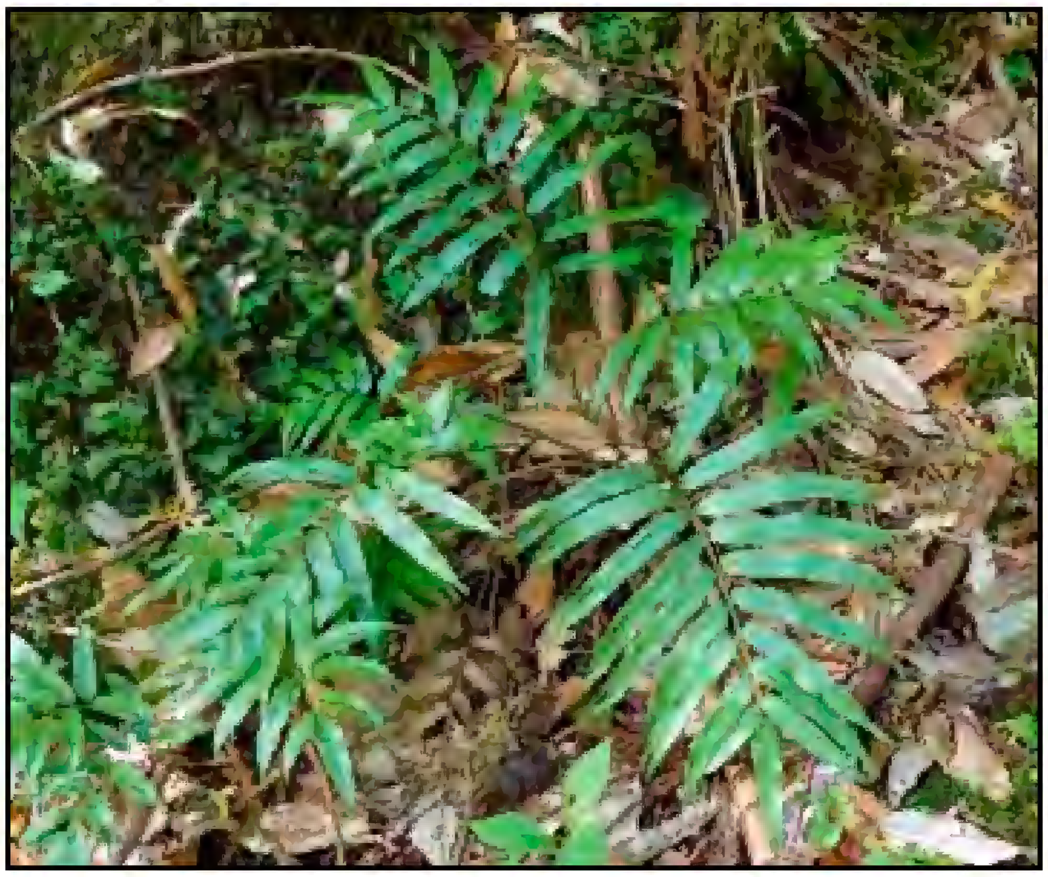

Fig. 4. *Plagiogyria euphlebia* in natural habitat, Japan 2014

In 2010 I saw *P. pycnophylla, P. glauca, P. euphlebia* (Fig.4) and *P. adnata* in Yunnan, and in Japan in 2014 the 2 latter species and also *P. japonica* were found. All were growing on rocky, forested slopes. Their requirements for successful cultivation would appear to be shelter, moisture, good drainage and neutral to acid soil, similar to many other ferns, making their rarity in cultivation difficult to explain. I have attempted to grow them from spores on two occasions but not managed to get beyond the prothallial stage. Spores need to be sown fresh for the best chance of success. Problems with providing the right conditions for successful propagation may be an explanation for their rarity. I am aware of only 4 species that are currently, or have recently, been in cultivation. No doubt others have been grown in the past, or may be lurking unnoticed in botanical gardens.

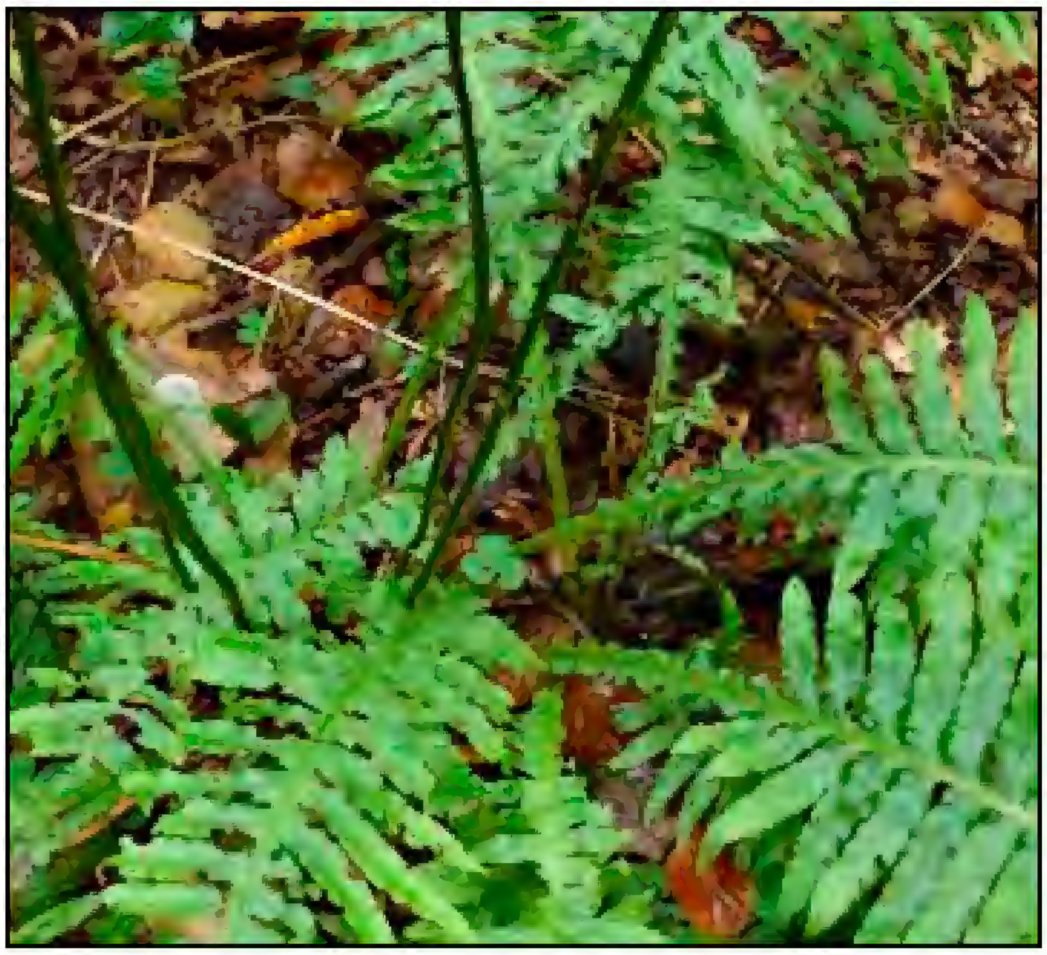

Fig. 5. *Plagiogyria stenoptera* showing pinnae reduced to auricles on the stipe

Plagiogyria pycnophylla

This medium to large species is most attractive and, due to the shortly stoloniferous habit, can form magnificent clumps of glossy pinnate fronds. A distinctive feature is the small horn-like aerophores located on the frond under-surface at the base of each pinna. (Aerophores are small structures that aid gas exchange with the atmosphere. Elongated aerophores often occur in ferns that have mucilaginous or slime-covered young fronds and these occur in some *Plagiogyria* species).This is the only species that I have seen more than once in British gardens. Undoubtedly the finest plants in the country are growing in a private Cornish garden. Here several impressive plants can be found near a stream. I have also seen a plant at Linn Botanic Garden in Scotland. It is widely distributed in Asia from the Himalayas, China, South-East Asia, and Malesia. A few enthusiasts are now experimenting with young plants in colder parts of the country, where it has suffered temperatures of -7C with no ill effects, so I hope it may become better known in cultivation (Figs.1, 2,& 3).

Plagiogyria glauca

This beautiful fern is closely related to the previous species and also possesses horn shaped aerophores. However this species has one astounding characteristic that immediately differentiates it. The frond undersurfaces are glaucous and in some forms can even be bright white. This may not be immediately obvious, as the fronds tend to spread horizontally; however, upon lifting the frond the contrast can be dazzling. The glaucous coating is waxy and its function is unknown. In herbarium specimens the wax may be lost, but traces can be found when examined carefully. I have not seen this species in cultivation, but Darren Hobbs, who gardens in Wales, has a plant collected in Taiwan at 2000m. It has survived frosts to below -7C with minimal protection. This is another widely distributed species with a similar range to *P. pycnophylla* (Figs.7, 8 & 9).

Plagiogyria stenoptera

Another species, of which I know only a single plant in cultivation. The evergreen fronds are widely spreading with the fertile fronds arising from the centre of the crown. The sterile fronds taper to the base, with several pinnae forming small auricles (reduced, ear-like lobes) on the stipe. Aerophores are inconspicuous in this species. Widely distributed, from Japan, Eastern China and Taiwan south to the Philippines (Figs.5 & 6).

Plagiogyria matsumureana

This species is endemic to Japan. It is the most northerly occurring species and probably the most cold-hardy. It is also the only deciduous species, losing its fronds over winter. The fronds taper towards the base, but the pinnae are not reduced to auricles as in the previous species. The only plant I have seen in cultivation used to grow on the peat banks surrounding the old alpine house at RBG Kew. I am not sure where this plant is now located or if it still exists. It is another attractive species that would be a welcome addition to fern collections.

I am sure there are other growers and enthusiasts that may have these species in their collections. There may also be other species in cultivation of which I am unaware. I would be very interested to hear from anyone who has had experience of these beautiful and interesting ferns. ❒

Acknowledgements

Several friends have helped with my understanding of these ferns, in particular, Darren Hobbs, Fiona Lanyon, Nick Macer, Martin Rickard and Jamie Taggart. Special thanks to Asher Ramras for help with Japanese translation.

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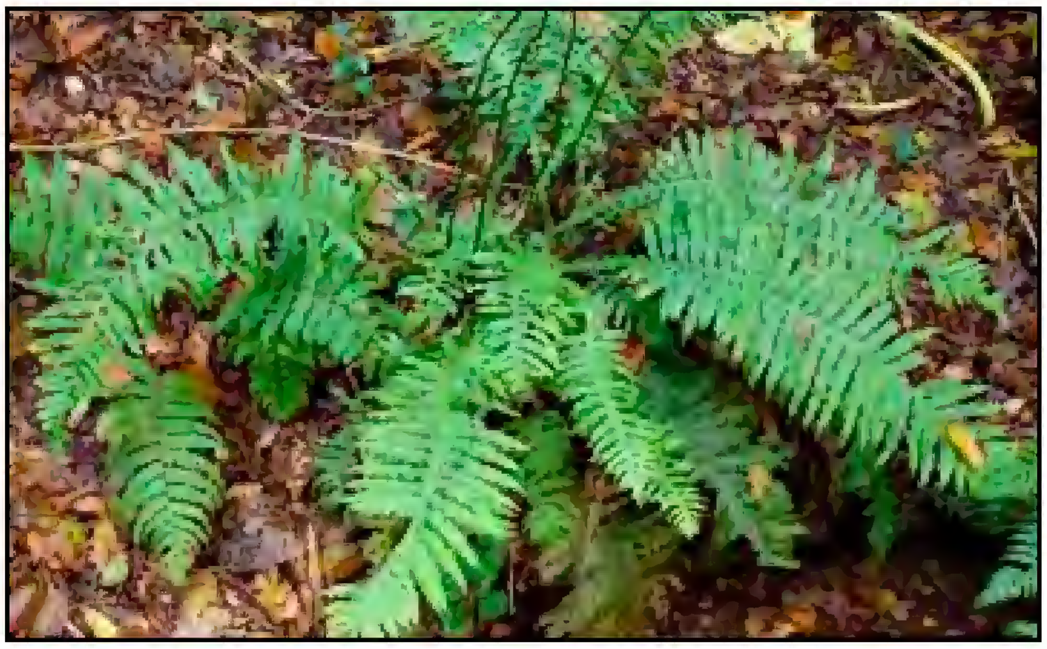

Fig. 6. *Plagiogyria stenoptera* in a Cornish garden

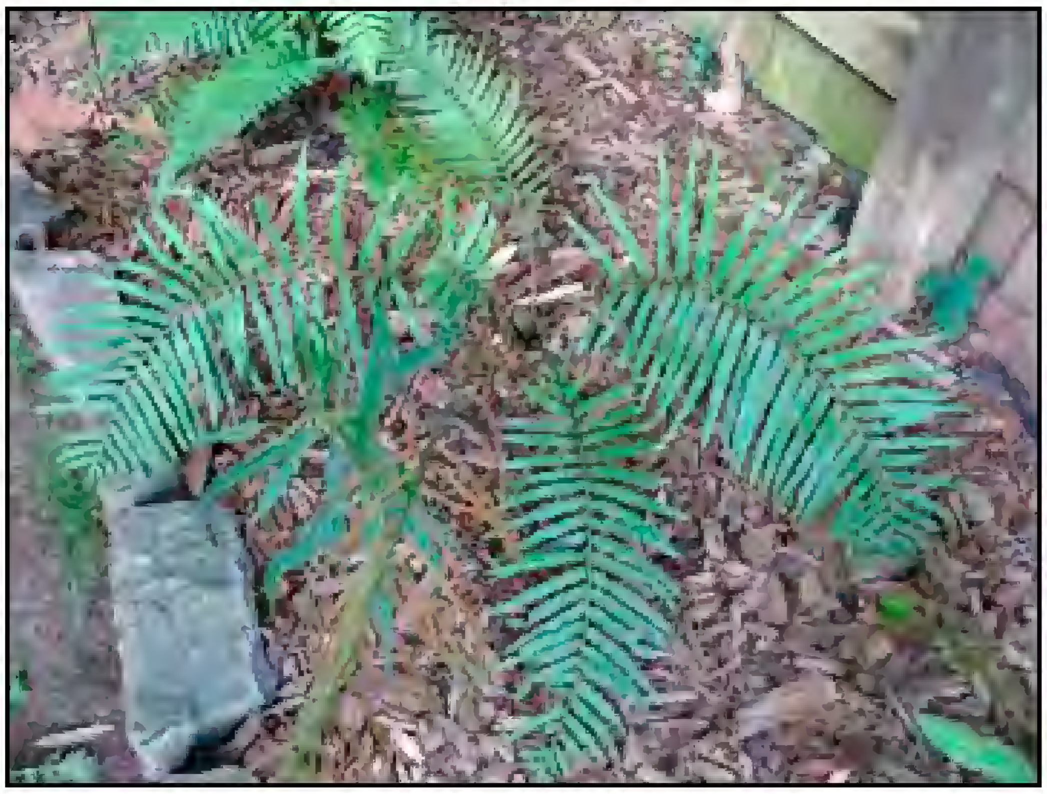

Fig. 7. *Plagiogyria glauca* in Darren Hobbs's garden, Wales

(Photo: Darren Hobbs)

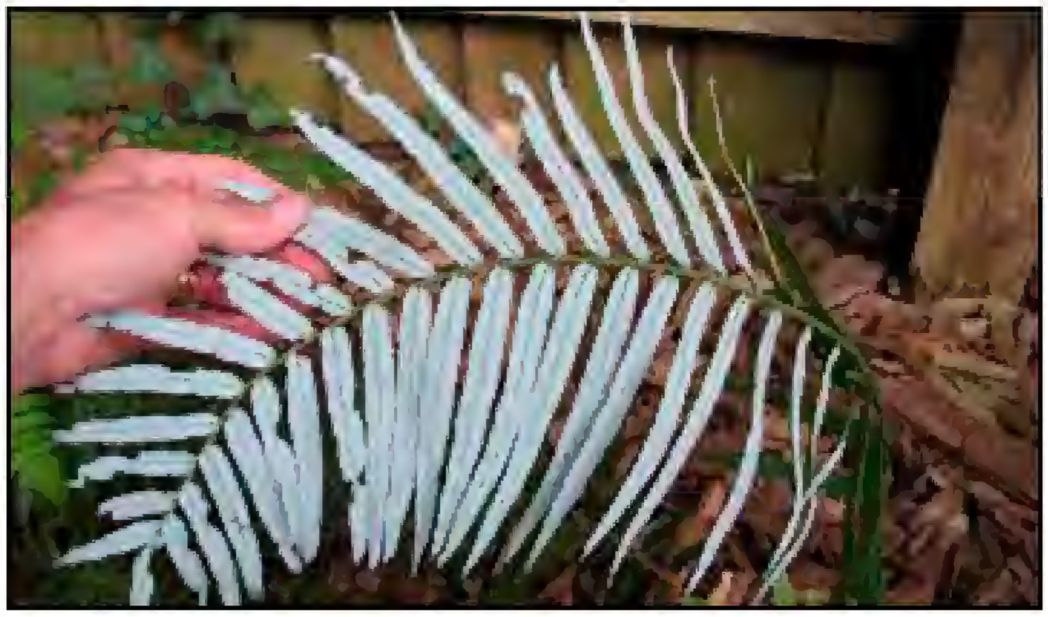

Fig. 8. *Plagiogyria glauca*, white under surface of frond

(Photo: Darren Hobbs)

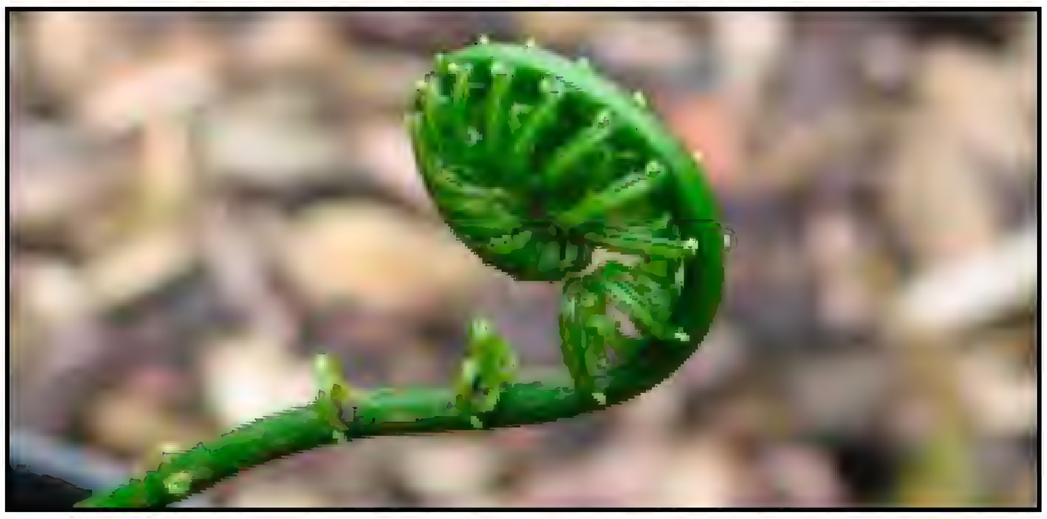

Fig. 9. *Plagiogyria glauca*, unfurling frond with aerophores

(Photo: Darren Hobbs)

The Cultivation of Leptopteris

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One of the highlights of a visit to New Zealand was the finding of large numbers of *Leptopteris superba* and *L. hymenophylloides*, particularly in the damp wet woodlands of South Island (Fig.1).

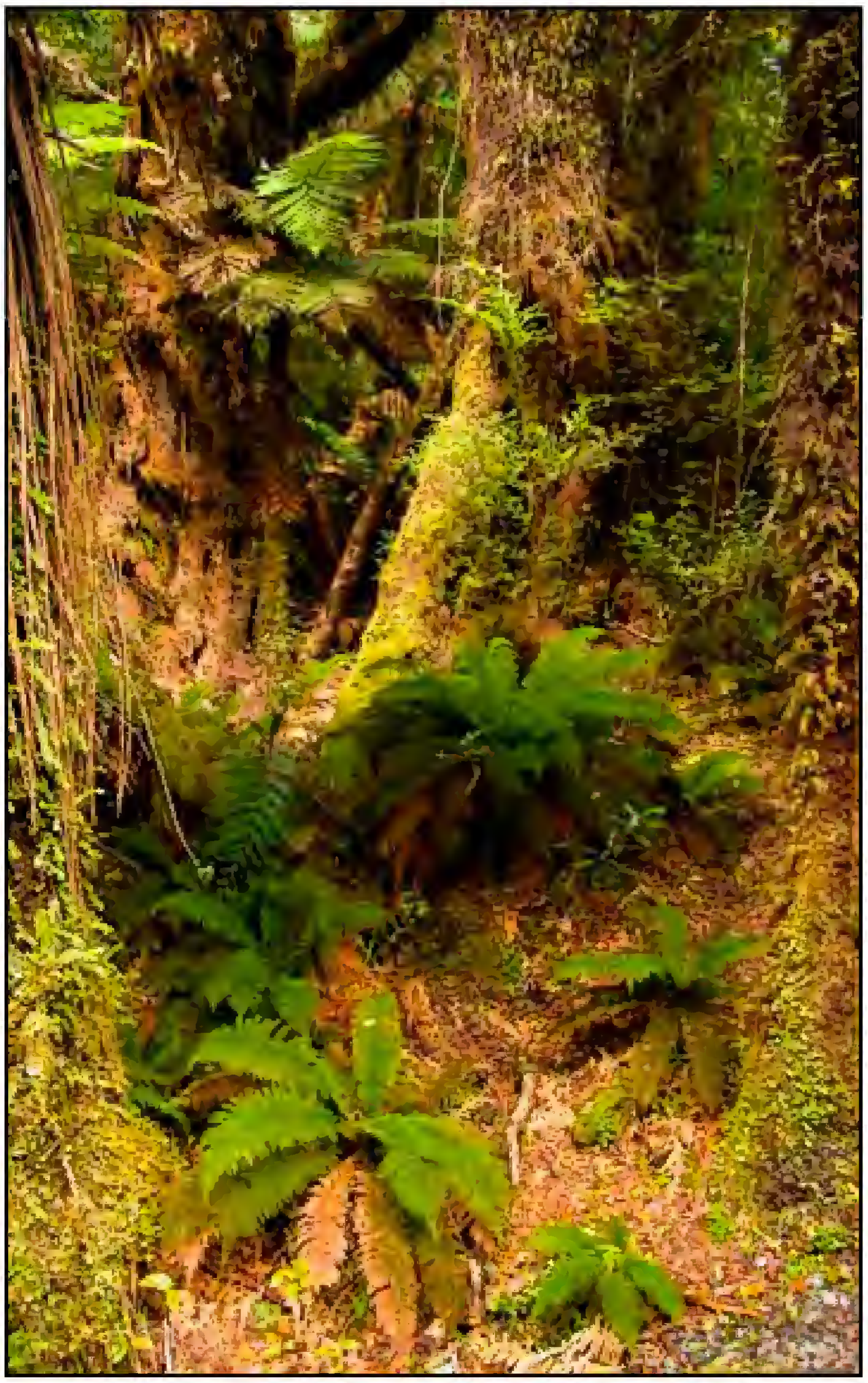

Fig. 1. A colony of *Leptopteris superba* in dark, damp podocarp woodland. Minnehaha trail, Fox Glacier, New Zealand South Island

The first indication of their presence was usually the finding of small sporelings, easily confused with filmy ferns. Like the filmies, the pinnules of *Leptopteris* plants are only one cell thick, an adaptation to habitats where the low light levels will not penetrate more than the superficial cell layer. Unlike many of the New Zealand filmy ferns, which shrivel in times of drought and rehydrate when remoistened, *Leptopteris superba* is much less tolerant of dry conditions and has a reputation of being difficult to cultivate. *Leptopteris hymenophylloides* is more tolerant. Both species need low light levels, high humidity and protection from extremes of temperature. The moss house at the Manchester University botanic gardens and the filmy fern house at Glasgow Botanic Gardens are such environments. For the home gardener without such a fernery, small plants may be grown in a suitably shaded fish tank or Wardian case (Fig.2). Mature plants need a considerable amount of space and Macself (1952) recommends a case measuring 3ft x 3ft x 3ft to house a single plant.

I was fortunate to acquire plants of both species from a commercial source and first adapted a section of two layer staging for their home in the greenhouse . Three sides were blocked in with 4mm double layer polycarbonate and two small sheets of clear acrylic hung across the front opening. The aluminium tray that formed the top of the staging was filled with fine grit and kept regularly watered in summer in order to cool the compartment below. The floor of the compartment was also grittted and kept constantly moist. The plants were sprayed twice a week and both plants thrived in this environment. However, they rapidly outgrew their home.

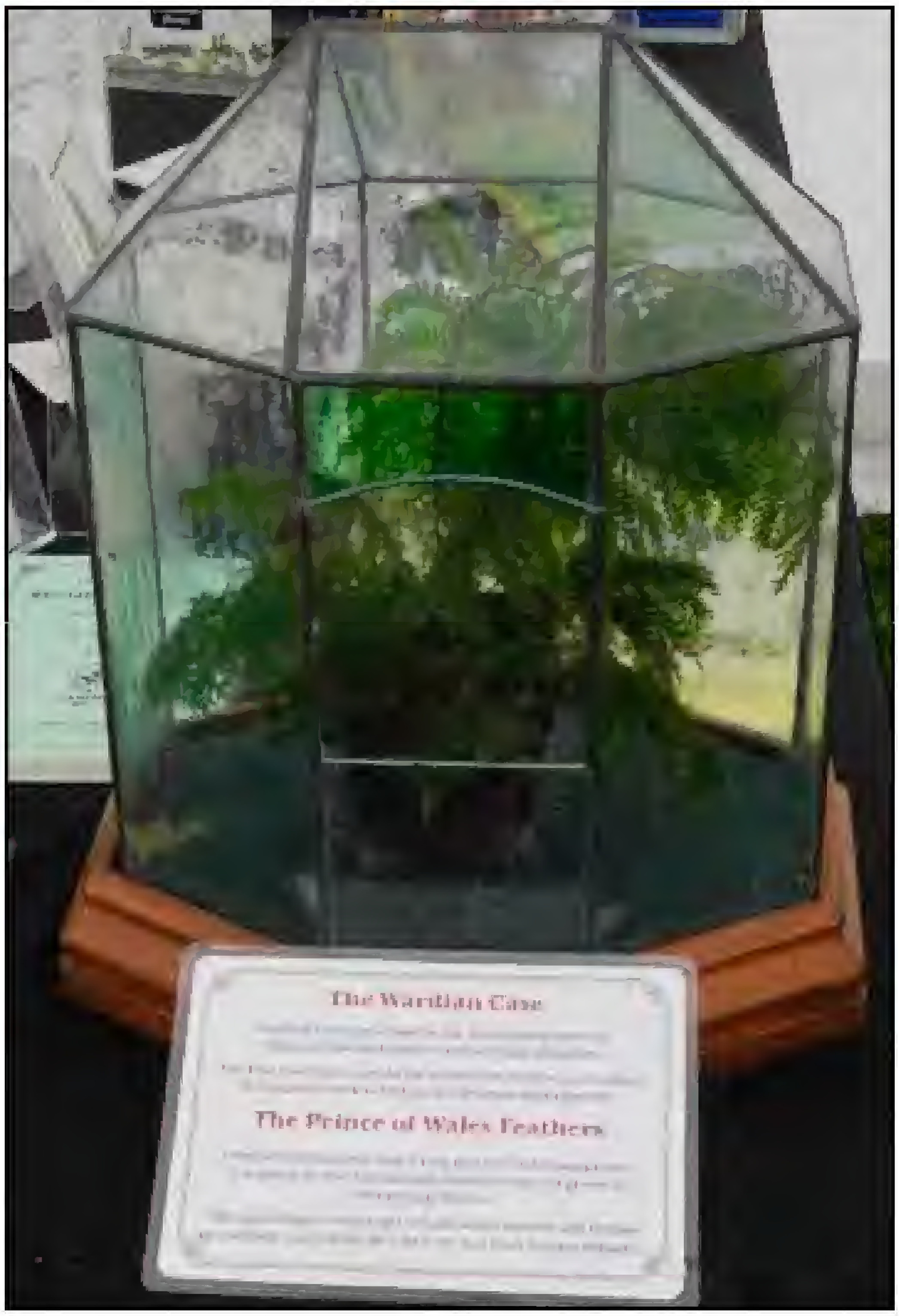

Fig. 2. A *Leptopteris superba* sporeling exhibited in a Wardian Case at the Southport Flower Show

To construct the present case, I purchased two kits of pre-treated timber designed for raised vegetable beds. One kit was used to make the base and the second kit the top, the original size of 6ft x 4ft being reduced to 6ft x 3ft 6in. 4ft treated timber uprights at each corner and one in the centre of the back were used to hold the top. Timber slats were added at the corners to provide a level surface for attachment of the polycarbonate cladding and five similar slats positioned across the top. 4ft x 2ft pre-cut sheets of double walled polycarbonate and of clear acrylic sheet (Perspex) are readily available from suppliers of greenhouse glazing and were used in the construction. Plastic channels (for sliding doors) were screwed to wooden battens and positioned across the front at top and bottom, the lower panel in a fixed position and the upper with provision for vertical movement to allow for fine adjustment (Fig.3). The base of the case was lined with a plastic sheet then filled with grit. Two large plastic trays were placed on the gravel and similarly filled. The clear acrylic panels used as sliding doors had a tendency to bow, so were eventually strengthened by lengths of angle aluminium fixed with grab adhesive to the long edges.

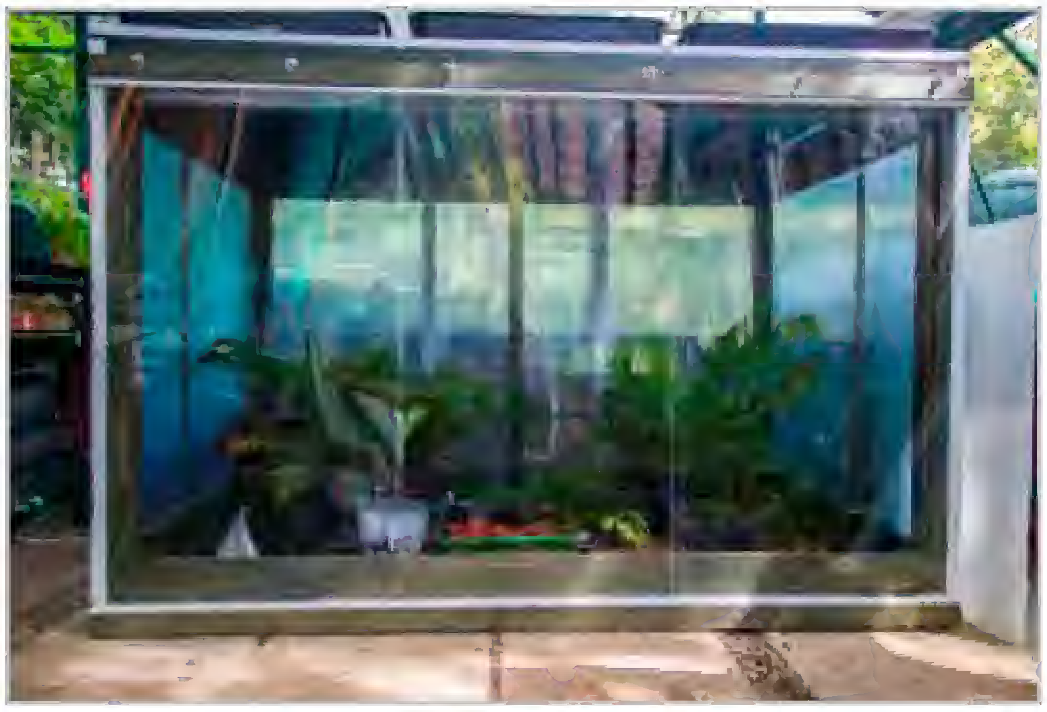

Fig. 3. Large case built in the greenhouse to hold two mature *Leptopteris* plants

In its present site, shaded by the brick dwarf walls of the greenhouse, the case has been easy to maintain and both plants thrive. The greenhouse is kept frost free with the thermostat set to 2°C but the greater concern is overheating. The whole greenhouse is well shaded. Both plants are in 20cm diameter plastic pots in a compost with a high humus content (Figs.4 & 5). Both initially had a layer of living sphagnum moss around the top, my reasoning being that if the sphagnum thrived then the ferns would thrive too. The base of the *L. hymenophylloides* plant is much more open than that of *L. superba* and after a couple of years self-sown sporelings started to appear. These were predominately of *L. hymenophylloides* but three sporelings appeared to be of *L. superba.* When removed from the sphagnum topping the sporelings took some time to adapt to their new compost but most eventually grew away. According to Dobbie (1930), the plants do not transplant well and that the best way to grow them is to raise them from spores in a Wardian case.

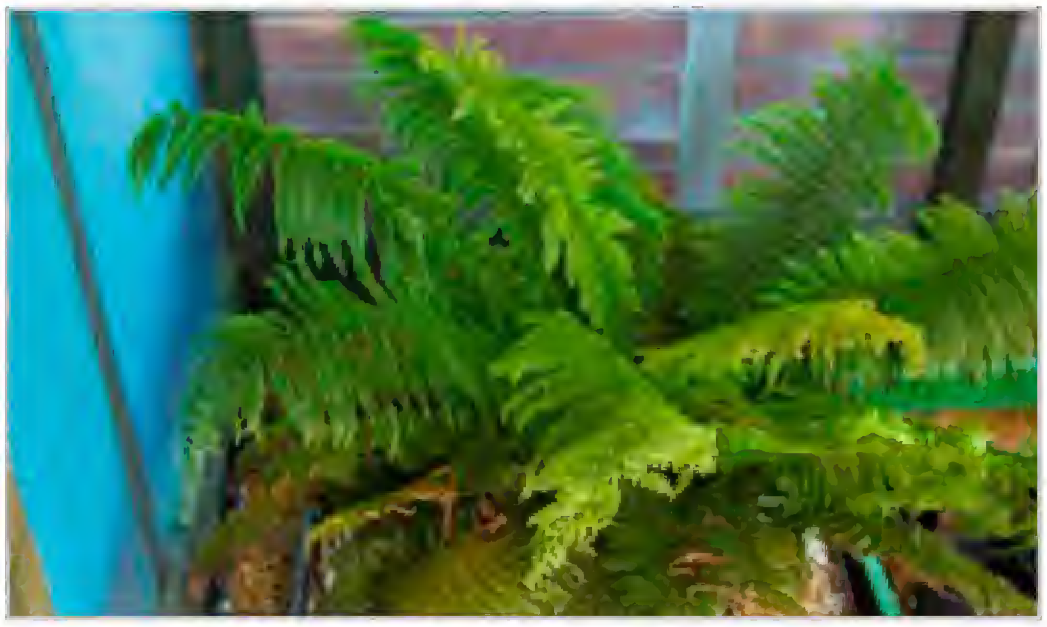

Fig. 4. Mature *Leptopteris superba* in case

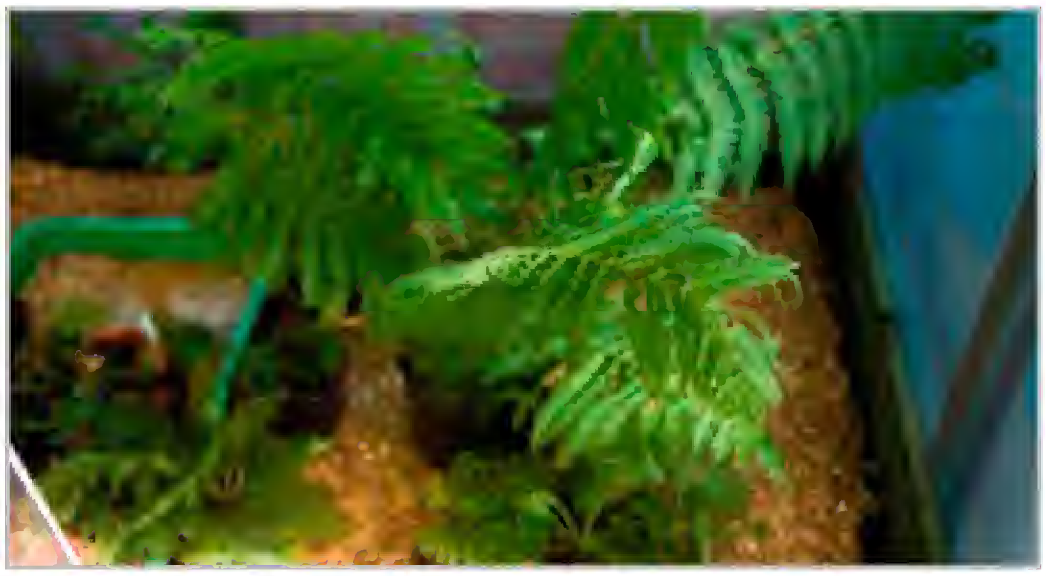

Fig. 5. Mature *Leptopteris hymenophylloides* in case

In due course, only one of the sporeling developed as a typical plant of *L. superba*. The other two, whilst having the densely feathery pinnules typical of *L. superba*, had the much longer stipes typical of *L. hymenophylloides.* Such fronds were included by Eric Craig, the maker of fern albums, in his top of the range album, labelled by him as *Todea intermedia* (Figs.6 & 7). Brownsey (1981) reports that the two species hybridise readily, as demonstrated in my greenhouse, and proposed the name *Leptopteris x intermedia* for the hybrid.

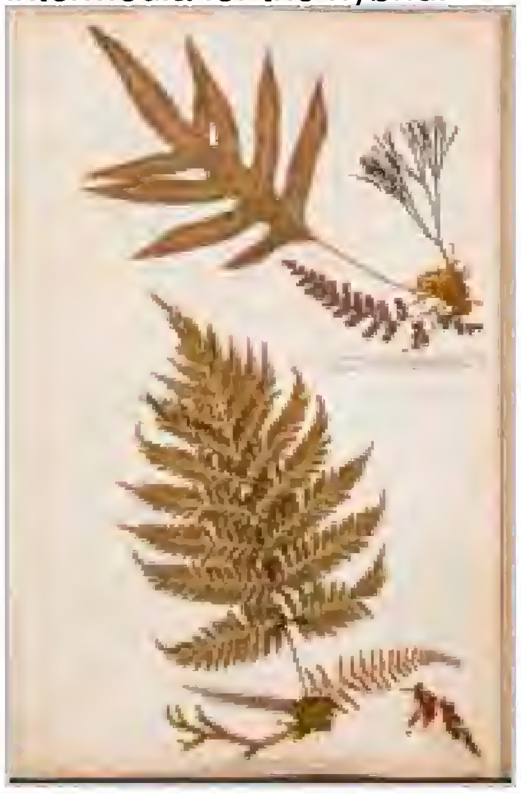

Fig. 6. *Leptopteris hymenophylloides* in N.Z. fern album by Eric Craig (1885)

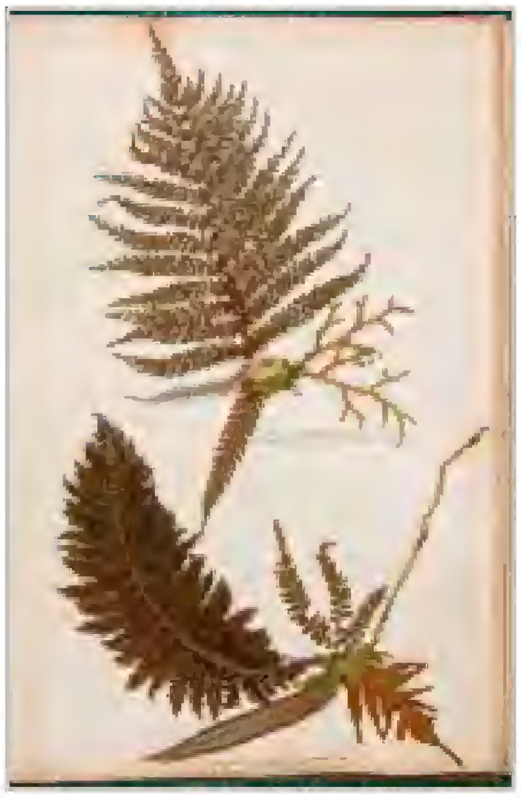

Fig. 7. *Leptopteris x intermedia (hybrid) and L. superba* in N.Z. fern album by Eric Craig (1885)

The two *Leptopteris* species belong to the *Osmundaceae* family and are confined to New Zealand and Australia. Both species are tripinnate. *L. superba* has a very short stipe and a lanceolate blade with pinnules tapering to both apex and base of the frond. The pinules are densely packed and stand up like the pile of a carpet (Brownsey and Smith Dodsworth, 2000). The appearance of the unfolding fronds gives the fern the common name of the 'Prince of Wales Feathers' (Fig. 8). *L. hymenophylloides* has a much longer stipe and a triangular blade. The pinnules all lie in the same plane and the frond has a much more airy and open appearance than that of *L. superba*. *Leptopteris* plants can be very long lived and eventually produce a short erect trunk of one foot or more. Both species produce abundant spores that are ripe in May (in Britain). Like other Osmundaceae, the spores are green and have a short period of viability. They should not be allowed to dry out before sowing. Examining the pinnules at this stage shows densely packed sporangia without the formation of sori (Fig. 9). A 1cm length of pinnule layed on a sheet of white paper overnight gives a yield of green spores sufficient to sow several pots.

In 2014 I decided to try raising plants from spores. Both species were sown in the usual manner onto surface sterilised compost in 10cm pots, and sealed in plastic bags. One pair of pots were placed inside the Leptopteris frame in the greenhouse. A second pair was place on my kitchen windowsill along with my general sowing of spores. Those in the brighter and warmer kitchen site greened up first but within eight weeks all four pots were greened up. Six months later the prothalli are still very small but are developing at a similar rate to *Osmunda* prothalli. I also tried enclosing small pinnule segments in paper packets and posting these to a number of members, all of whom have had no difficulty in germinating them. Next year I plan to make some mixed sowings to encourage the formation of hybrids.

Brownsey and Smith-Dodsworth report that *L. hymenophylloides* is considerably easier to cultivate than *L. superba* and that its cultivation is *"quite easy in a damp fernery in soil having plenty of humus. Can stand relatively dry, cold conditions and likes fairly heavy shade".* The possibility arises of growing it out of doors in suitable areas of Britain (but not in my garden with its sandy soil and drying costal winds). At least one member successfully established *L. hymenophylloides* in his South Wales garden. If the plants can be raised at home in reasonable numbers, rather than plants expensively air freighted from New Zealand, then there is an incentive for others to try planting them out of doors. ❐

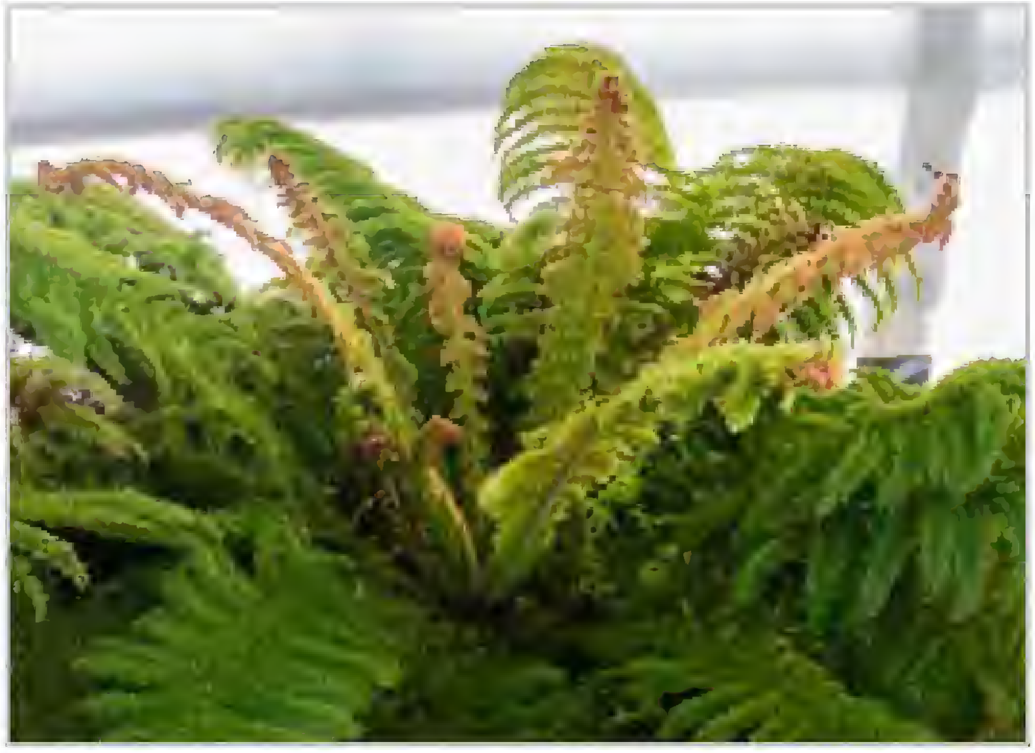
Fig. 8. New growth on *Leptopteris superba,* giving the fern its vernacular name, 'The Prince of Wales Feathers'

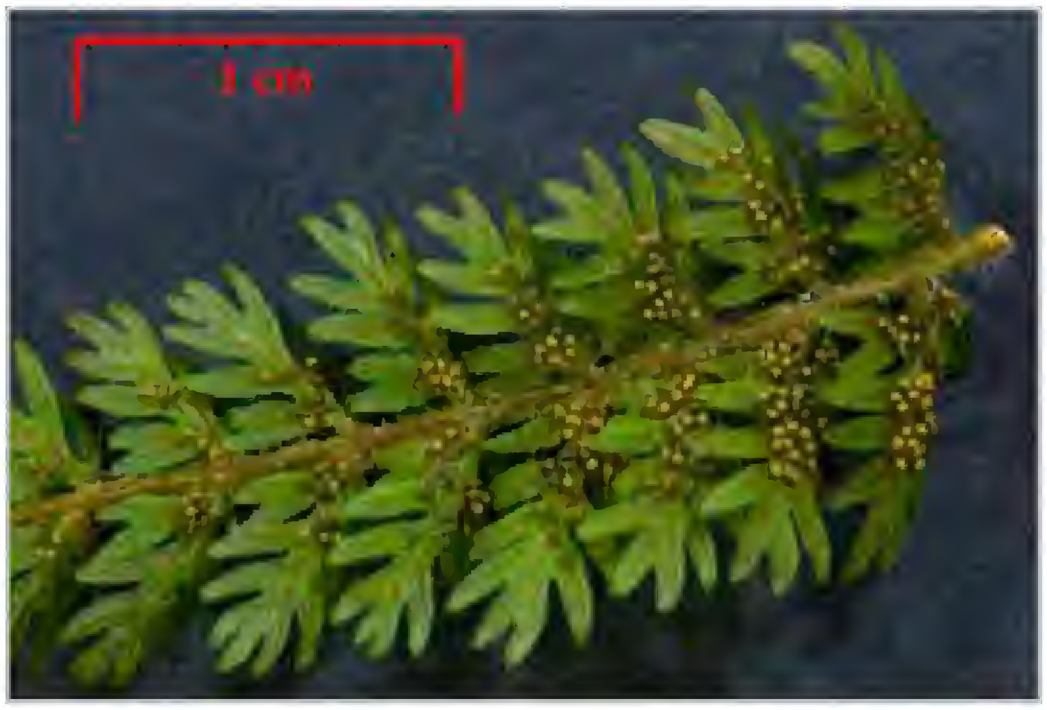

Fig. 9. Bare sporangia on *Leptopteris superba*. Note that the sporangia are not grouped into sori in the Leptopteris family

A Wall Fern?

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Last year my wife was determined to redecorate our downstairs toilet. When she was looking at wallpaper in a well known D.I.Y. store she came across a roll that seemed perfect. (Fig.1)

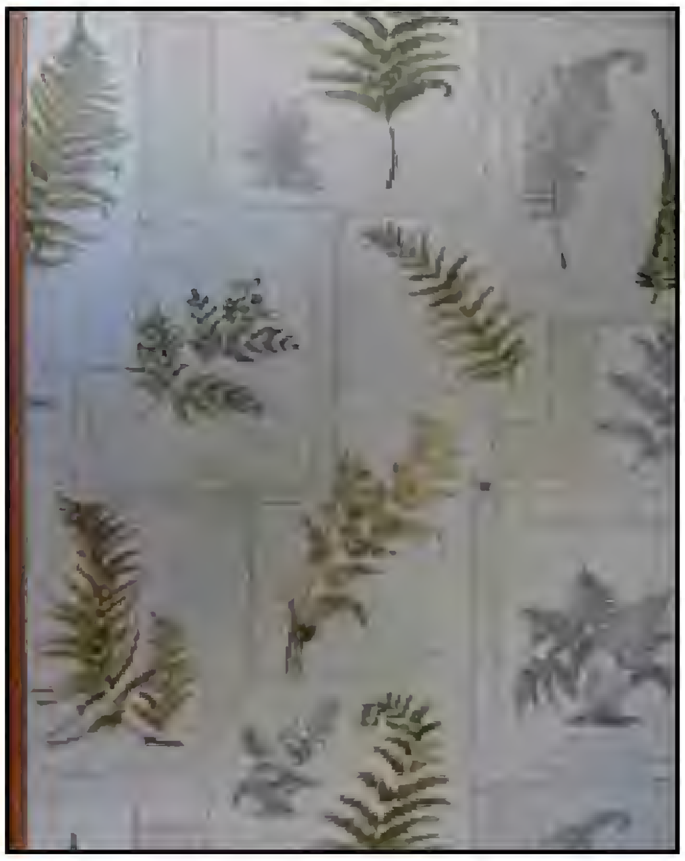
Fig. 1. The new wall paper in place

It would appear to be composed of illustrations from old fern catalogues and one of them caught my eye (Fig. 2). Is that really an picture of *Woodsia alpina*?

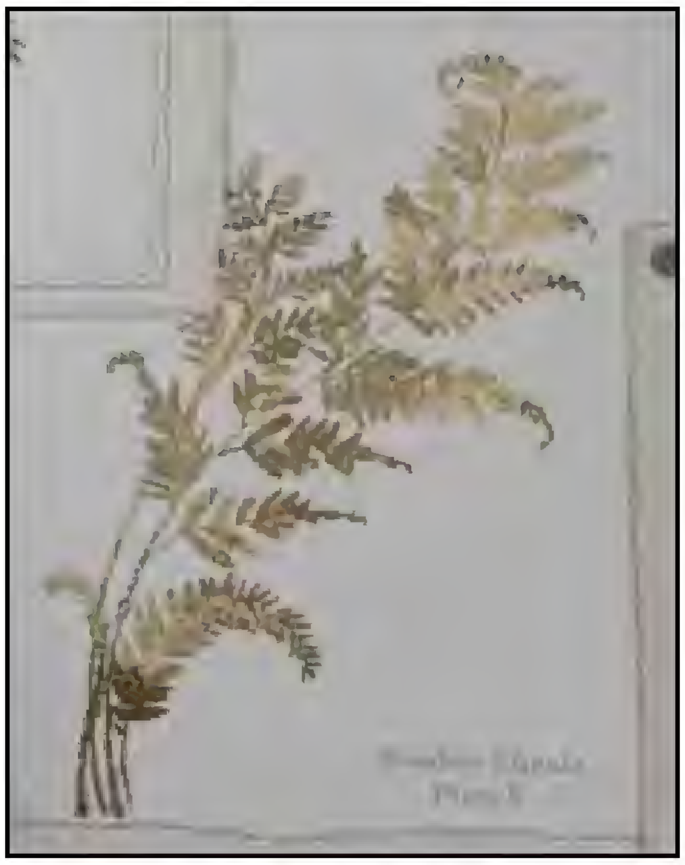
Fig. 2. Detail showing an illustration titled *Woodsia alpina*

Comparing it to an early print taken from Bradbury's '*Nature Printed British Ferns'* and then with a modern photo (Figs.3 & 4) I can only assume that this is a case of artistic licence.

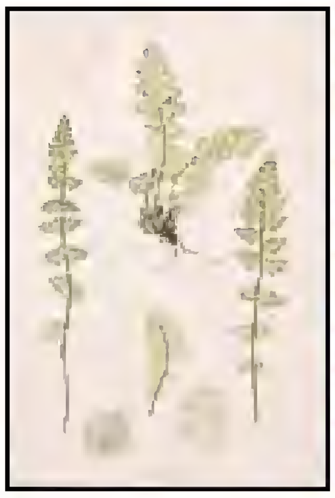
Fig. 3. A print of *Woodsia Alpina.* Taken from '*Nature Printed British Ferns*' by Moore and Bradbury (1859)

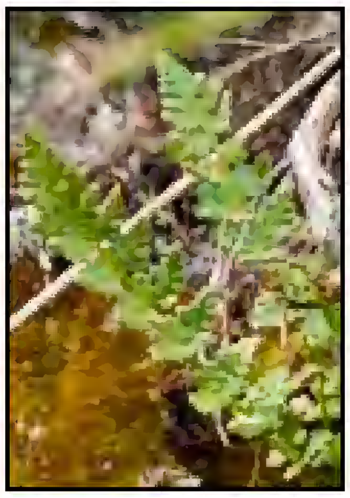
Fig. 4. *Woodsia alpina* growing in Western Scotland
(Photo: R. Golding)

Still, it brightens up the smallest room and makes it far more pleasant. Ferny friends often seem to make excuses to use the facilities! ❐

Soft Shield Fern Varieties

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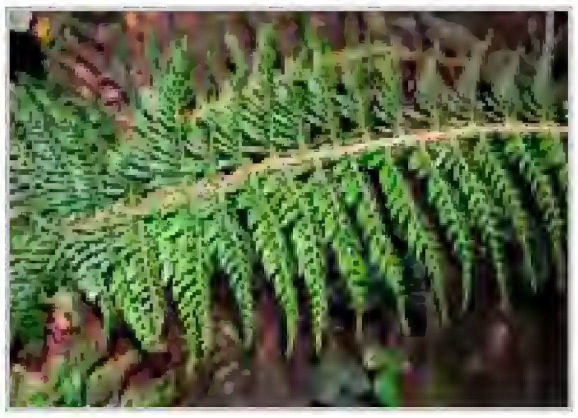

Fig. 1. *Polystichum setiferum* 'Divisilobum'
(Photo: Gert Jan van der Kolk)

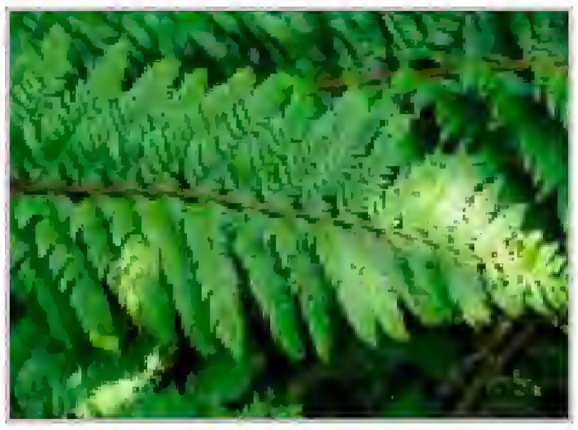

Fig. 2. *Polystichum setiferum* foliose variety
(Photo: Gert Jan van der Kolk)

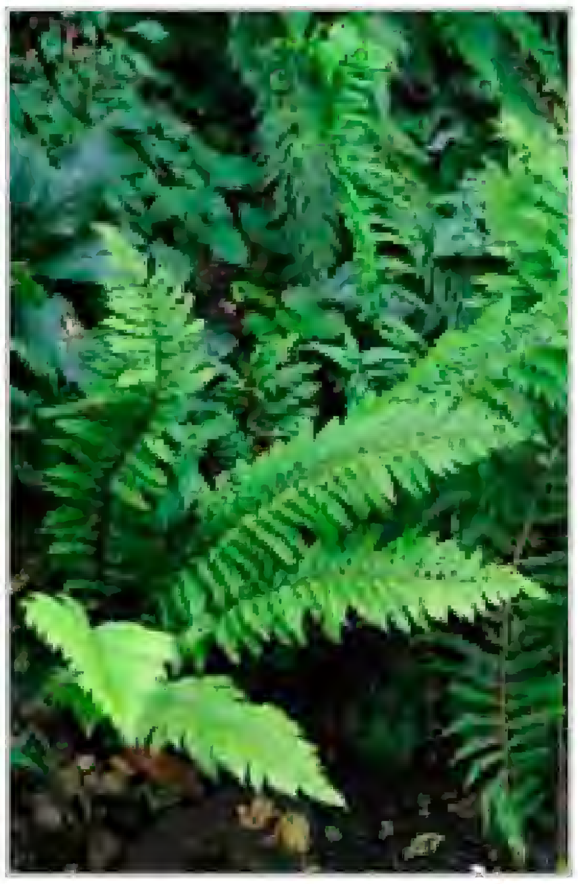

Fig. 3. *Polystichum setiferum* foliose variety (left) and Lineare Group (right)
(Photo: Gert Jan van der Kolk)

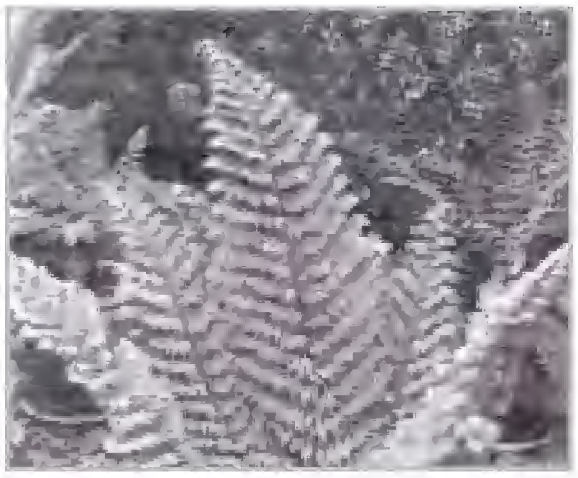

Fig. 4. *Polystichum setiferum* 'Plumosum Grande Moly'
(photo taken from '*Polystichum Cultivars*', photographer unknown)

I dropped in on a British Pteridological Society meeting in the Cotswolds in 1978 because it was based near where my parents lived at the time. I was vaguely interested in ferns and fern allies, having studied geology in the Forest of Dean an old coal mining area where fossil horsetails and seed ferns abound. However there was only one fern which I could reliably identify, *Polystichum setiferum* 'Divisilobum' which my mother grew and which she used in flower arranging. I'd already grown some plants from the bulbils on the rachis.

The meeting gathered on the Sunday on Selsley Common[1], on a wooded ridge which looks out over the Severn Valley. While other members were shouting out species as they found them I wandered off. At the base of an old tree I spotted a fern which I recognised, so I called out "*Polystichum setiferum*", a species which we'd not seen at that site. What to me was a pretty ordinary plant caused a lot of excitement. I learnt then that plants in the Divisilobum group very rarely turn up in the wild.

I found another one in Shotover Country Park in 2005, which was shown to members who attended the Oxfordshire meeting[2] of the society and which is still thriving in the wild (Fig.1).

I've grown specimens of the original Cotswold plant ever since, in gardens in Manchester, Lincolnshire and now Oxfordshire. It hasn't proved easy to propagate; although it produces bulbils these seem reluctant to develop into plants. I have divided it from time to time and have a few spare plants at the moment.

The next variety of *Polystichum setiferum* which I grow was bought from Reginald Kaye in about 1980 as 'Divisilobum Group' (which it clearly is not!). It is a lovely foliose plant (Fig.2) which I'm tempted to describe as a plumose variety. Fig 3 shows the same plant, with the Lineare Group plant referred to below. It is highly fertile, producing masses of spores in a good growing year like 2014. Unfortunately it is reluctant to produce separate crowns. Julian Reed has suggested that it closely resembles *Polystichum setiferum* 'Plumosum Grande Moly' (Fig.4)[3] although that variety is described as "always completely sterile". This plant seems to me to defy classification.

I also grow a plant which I think belongs in the Plumoso-divisilobum Group (Figs.5 & 6). This was given to me quite a few years ago and I'm greatly indebted to the donor. It's a very fine plant.

In 1992 several committee members were invited to visit Ted Wright's garden in Beaconsfield[4]. Ted and his brother had been collecting ferns since the 1930s. He now wanted some of his plants to be rescued. We enthusiastically rose to the challenge! At the time, I recall that Martin Rickard identified one plant as 'Hirondelle', although that identification now seems doubtful [5]. 'Hirondelle' dates from the 1860s or 1870s and was discovered by a collector called J Moly. It was then passed to W. B. Cranfield who died in 1947. Neither of them apparently spread it around so the variety has long been presumed lost.

My plant is certainly a good member of the Lineare Group. (Figs.7 & 8 and also to the right in Fig.3). It has been referred to as 'Hirondelle' [6] and I so described it during the Cultivar Group meeting at

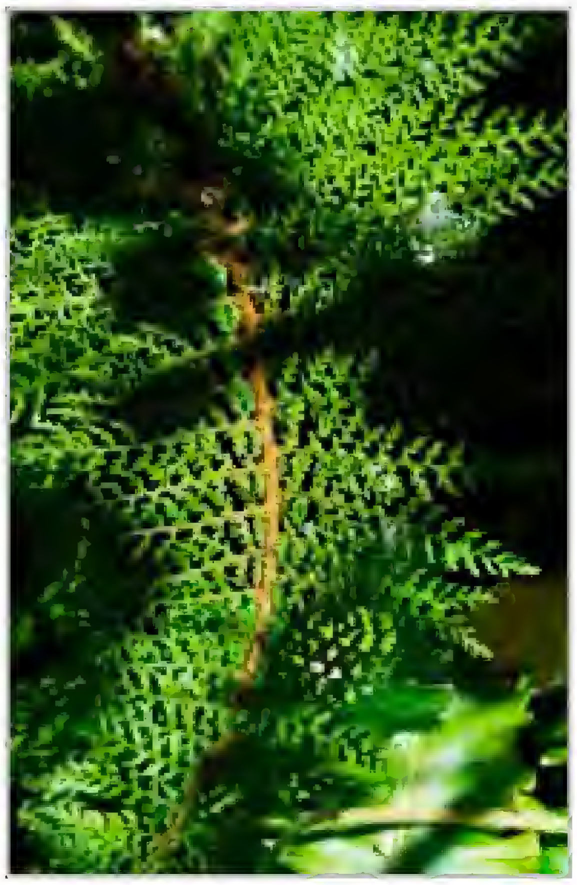

Fig. 5. *Polystichum setiferum* (Plumoso-divisilobum Group)
(Photo: Gert Jan van der Kloek)

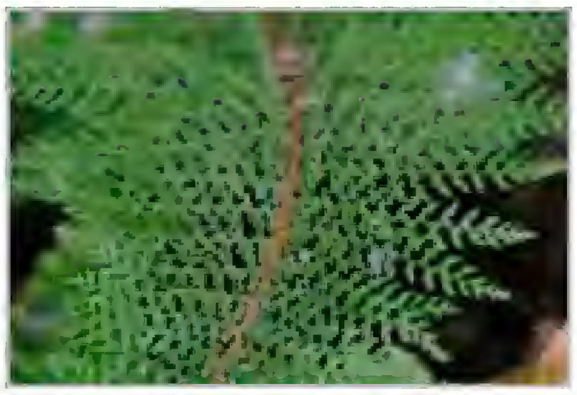

Fig. 6. *Polystichum setiferum* (Plumoso-divisilobum Group)
(Photo: Gert Jan van der Kolk)

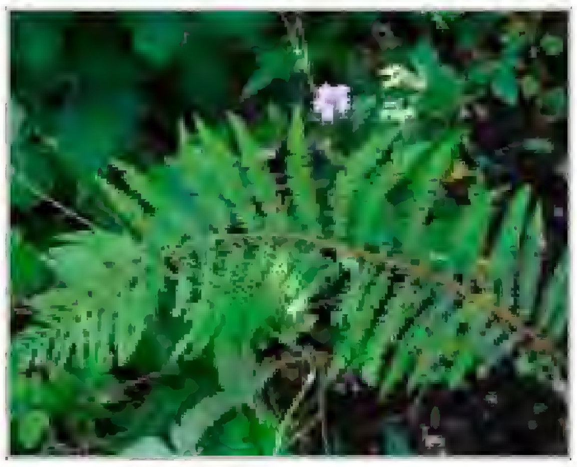

Fig. 7. *Polystichum setiferum* (Lineare Group)
(Photo: Gert Jan van der Kolk)

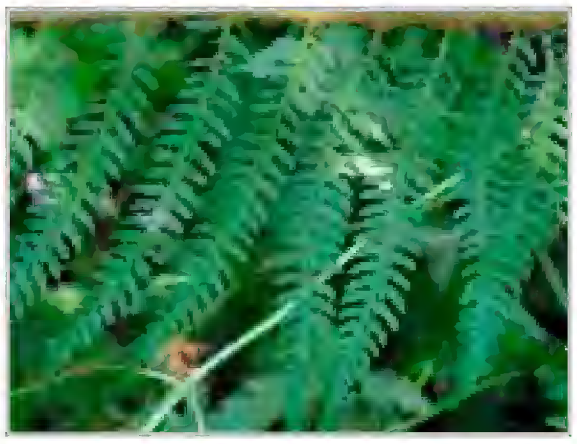

Fig. 8. *Polystichum setiferum* (Lineare Group) detail
(Photo: Gert Jan van der Kolk)

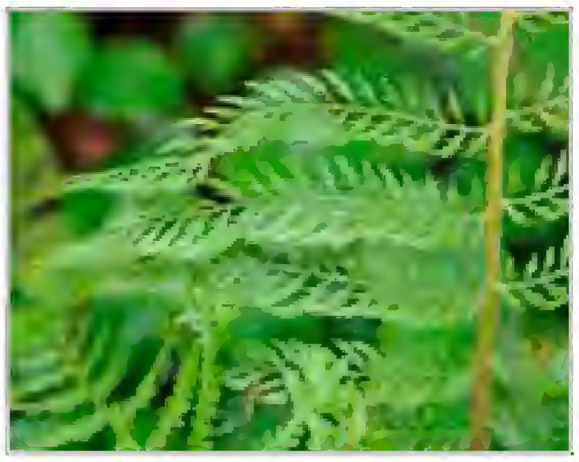

Fig. 9. *Polystichum setiferum* 'Gracillimum'
(Photo: Gert Jan van der Kolk)

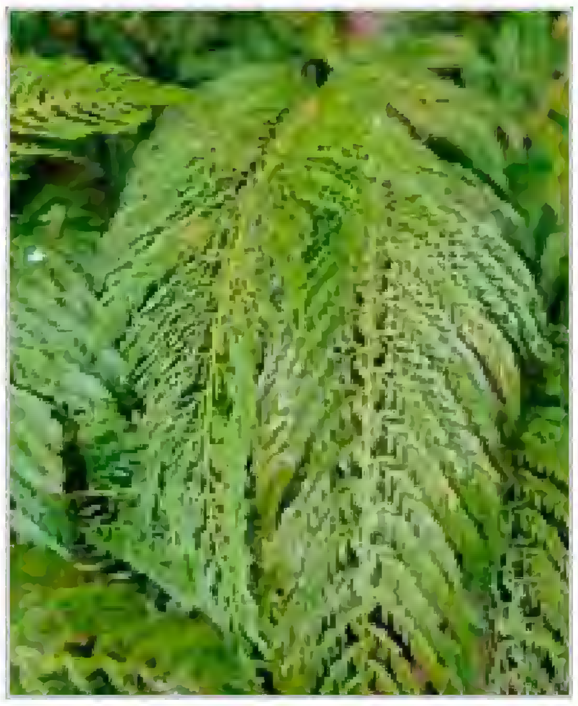

Fig. 10. *Polystichum setiferum* 'Gracillimum'
(Photo: Gert Jan van der Kolk)

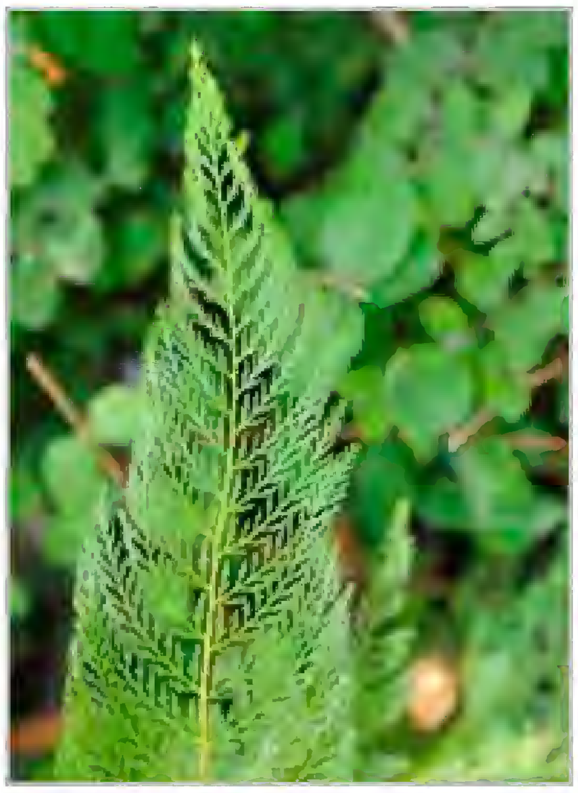

Fig. 11. *Polystichum setiferum* 'Gracillimum'
(Photo: Gert Jan van der Kolk)

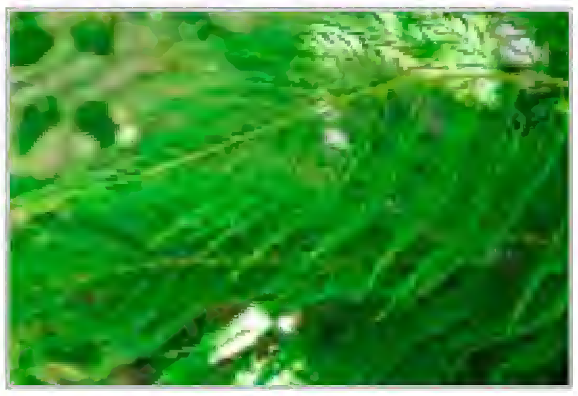

Fig. 12. *Polystichum setiferum* 'Gracillimum'
(Photo: Gert Jan van der Kolk)

the Savill Gardens in 2014. Gert Jan van der Kolk has compared it with his specimen of (Lineare Group) 'Chardstock' and the two plants look to me to be identical.

The original 'Chardstock' as described by Dyce[7] in an article about 'Hirondelle', was found by Martin Rickard in 1980. Dyce suggests that the pinnules of the true 'Hirondelle' were more slender and tapered than those of 'Chardstock'. I agree that the photographs with this article suggest a more leafy plant. But the pinnules of my plant are tapered and the plant which was collected by Martin Rickard in about 1980 could not have found its way into the collections of two pteridologists from an earlier generation. Dyce noted that the original 'Hirondelle' was fertile and that the plant illustrated in his article was a sporeling from the original. Is it possible that a few sporelings from the original plant as grown by Moly and then by Cranfield may have survived in other collections?

My remaining *Polystichum setiferum* varieties are an assortment of 'Bevis' sporelings. In around 2000, pots labelled 'Bevis' began to appear at Rare Plant Fairs. I could see the similarities but did not believe they were the real thing. They were also overpriced. As often happens the original few arrivals became a glut and they began to appear at various garden centres. I spotted a potfull of sporelings which had several 'Bevis' characteristics, among the discards at Notcutts, and bought the lot for £5.

I pricked out over 40 plants most of which were pretty close to typical 'Bevis' and several of which fooled the experts who visited our garden in 2005. At that time I thought I had a couple of decent Gracillimums and another which was tending towards that character. Ten years of growing in our garden have let the plants show their true character and it is now clear that there are at least 5 Gracillimums (Figs,9, 10, 11 & 12), the latter showing the small tassels at the tips of the pinnae as well as some very typical Bevises (Figs.13, 14 & 15). Following a very wet winter these plants were at their best ever during the fine summer of 2014 as I hope the photographs which accompany this article show.

I am indebted to Gert Jan van der Kolk for the excellent photos and to Julian Reed who encouraged me to tell the story of my *Polystichum* varieties. ❒

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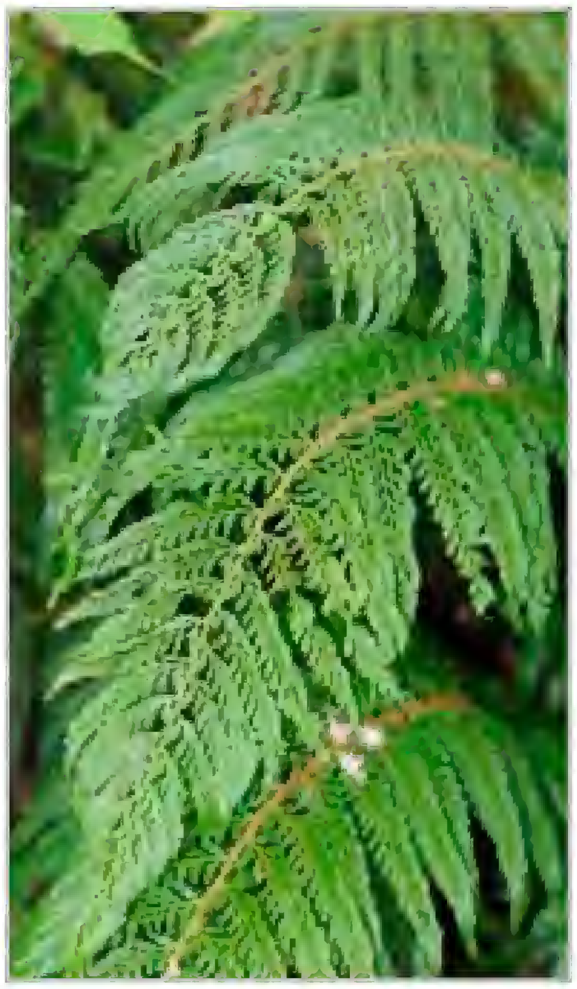

Fig. 13 *Polystichum setiferum* (Bevis Group)
(photo: Gert Jan van der Kolk)

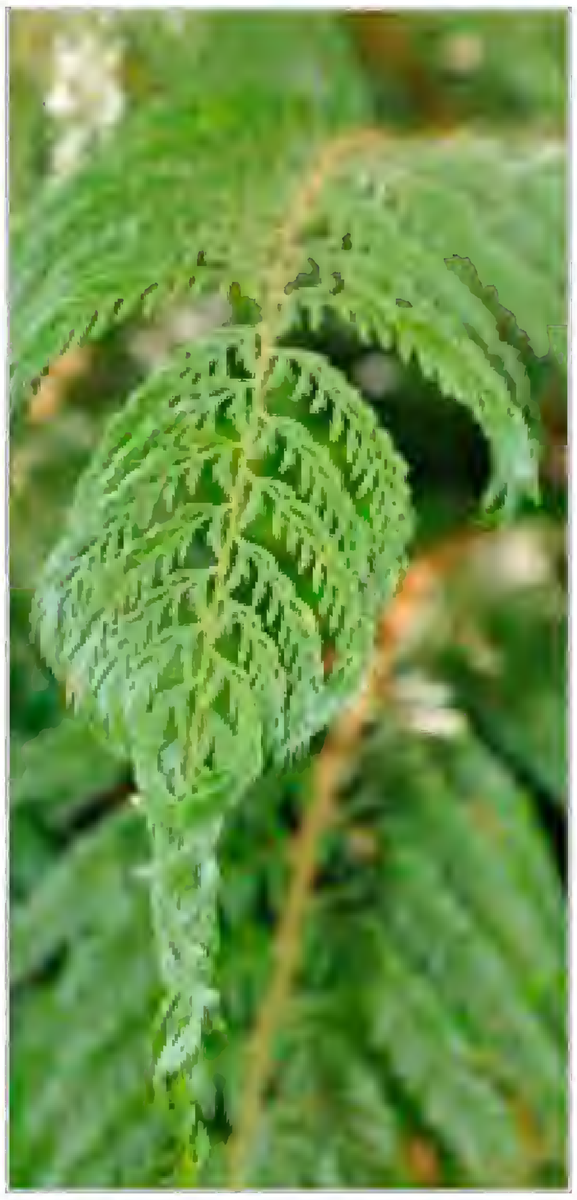

Fig.14. *Polystichum setiferum* (Bevis Group)
(Photo: Gert Jan van der Kolk)

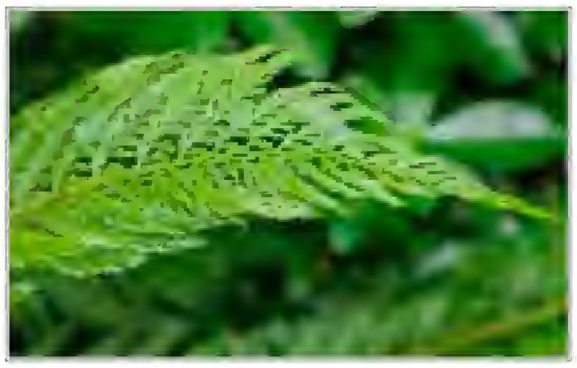

Fig. 15. *Polystichum setiferum* (Bevis Group)
(Photo: Gert Jan van der Kolk)

Tree Fern Newsletter 2015

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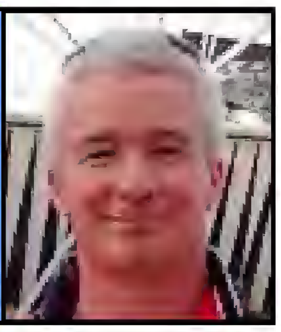

Welcome to the 2015 edition of the Tree Fern Newsletter. As some of the longer serving members may remember, this newsletter used to be a regular feature of the *Pteridologist* and was compiled by Alastair Wardlaw until a few years ago when he was no longer able to commit the time to it.

So the newsletter returns this year after a short break and I do hope that I am able to pull together a selection of articles of similar quality to that which Alastair used to enthral fern fans with. Perhaps the most important thing is that it relies on the contribution of other members. So I will start this newsletter with a plea for articles from any members out there, anywhere in the world who wish to write an article for the 2016 edition of the *Pteridologist*. A short flick through the various articles in this publication will quickly prove that there is no subject too obscure and no fern related ditty too irrelevant so please do email me with any ideas you have for an article whether it be a short anecdote, photo tour of your fernery or a multi-page travelogue. If it has tree ferns in it – I will put it in the newsletter!

I made a contribution to the 2005 edition of the newsletter which featured a short photo tour of my little tree fernery in Southampton, England. I was fairly new to the hobby then but terribly enthusiastic and quickly took up growing tree ferns from spore, which I have to say, 10 years later I am still trying to perfect.

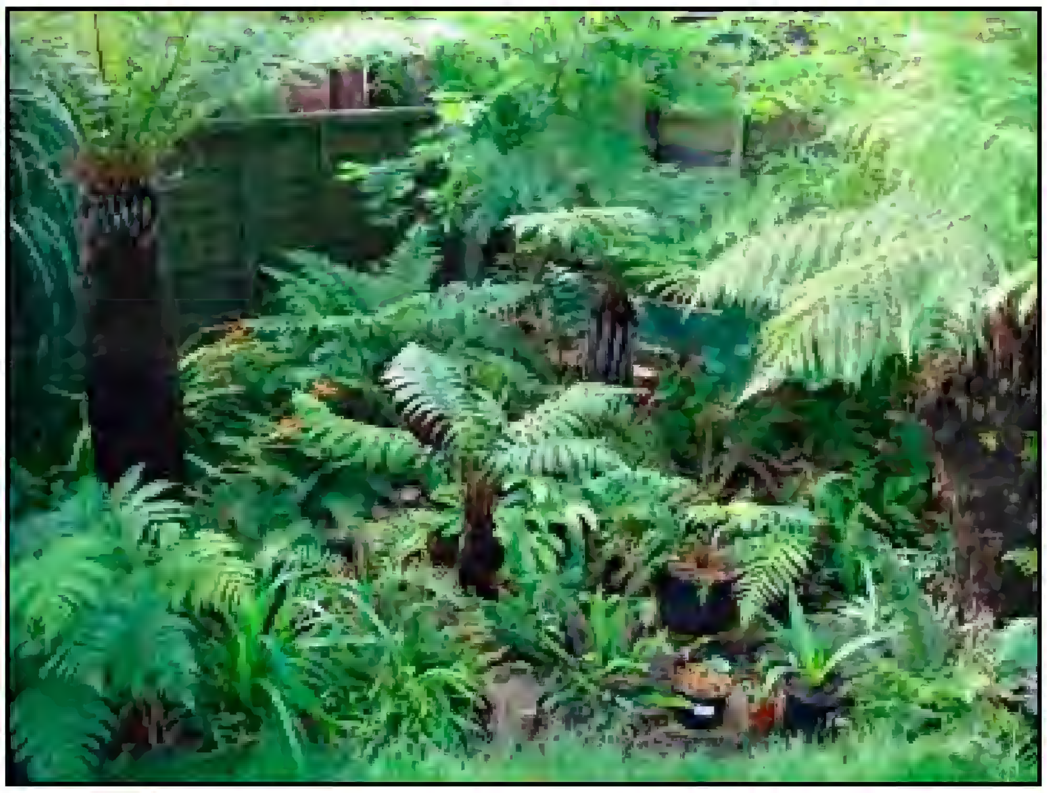

Fig. 1. My tree fernery in Southampton, England

In 2007 I emigrated to New Zealand and now reside in Auckland which has probably the best climate for temperate tree ferns that I could ever wish for! So it is with a mixture of experiences growing tree ferns in both the inhospitable and the ideal climates that I hope to bring a balanced view on the subject of cultivation along with some fascinating contributions from other members of the Society. ❐

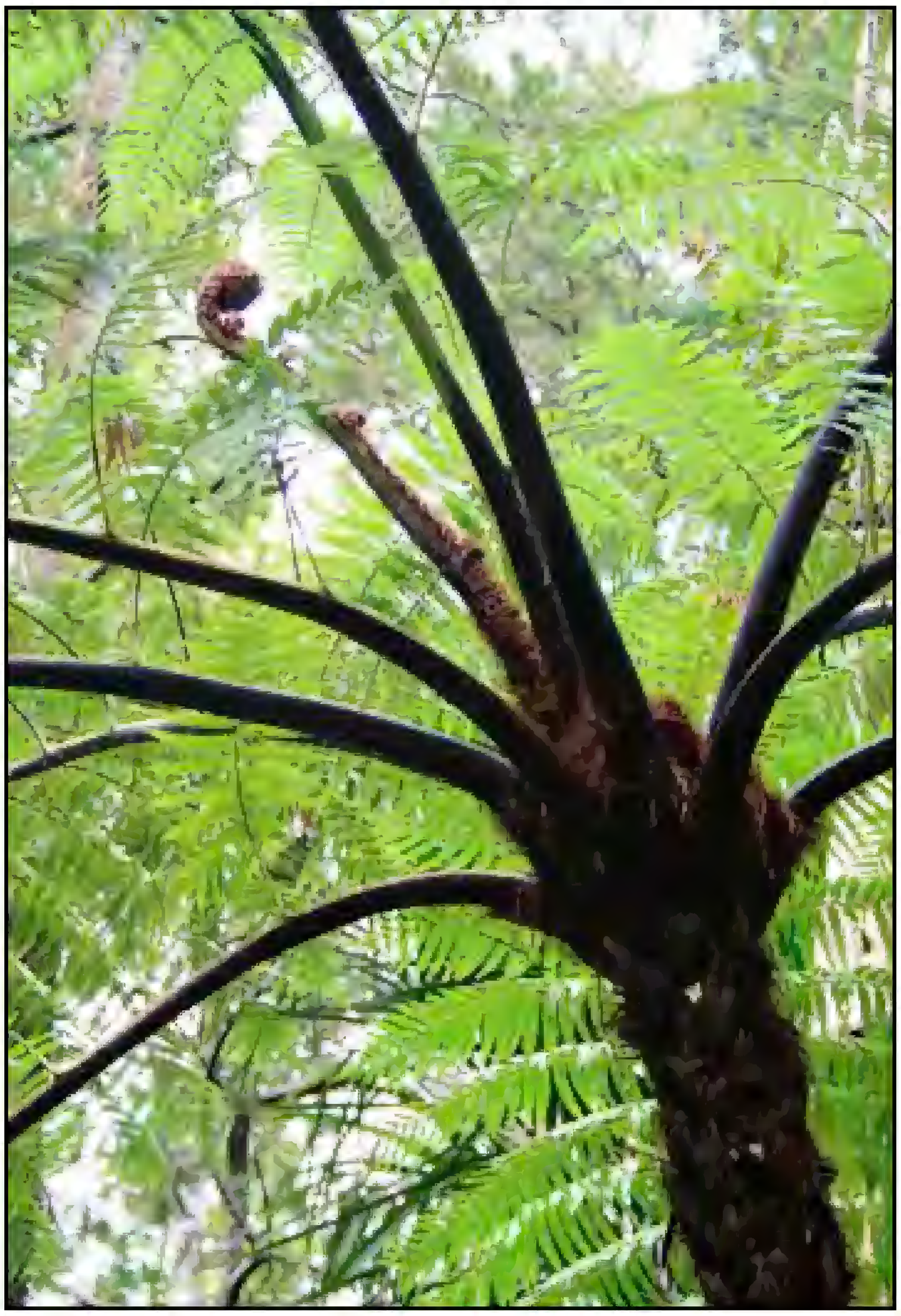

Fig. 2. *Cyathea medullaris* on a hillside in Auckland

A Small Tree Fern Regeneration Project

Mark Longley

In November of 2014 we finally finished building our house here in the eastern suburbs of Auckland and I could now start some proper gardening again! No more pots!

Our house is built on the edge of a very steep gully which, before it was cleared by a developer, was packed full with Nikau Palms and Silver Tree Ferns. So as not to be accused by any greenies out there of ransacking the land for my own gain I can assure you that my preference would have been for the developer to leave all of that lovely native bush just where it was. But now that the house is finished, the drains laid and buried and my sanity restored after an arduous build I am slowly replanting the gully with the same native plants that were there before. The prime specimen is a 2-metre trunked *Cyathea dealbata* (see image) which ironically I dug up from someone's garden a year earlier as they were building an extension on their own house and wanted it gone! I bought it for the equivalent of 10 pounds, re-established the rootball in a pot and now here it is back in its native habitat. I will post another shot from this angle next year so we can see how it has developed. ❐

Mount Kinabalu, Borneo

Probably the Best Tree Fern Destination in the World

Mark Longley

Have you ever tried to picture the perfect place to enjoy tree ferns in their own habitat? It has to be somewhere with the perfect climate, unspoilt, easily accessible, safe to visit (which is getting harder these days isn't it?) and, above all else, have a large variety of different tree fern species to discover and enjoy.

My home country of New Zealand covers most of those bases but the different species are spread out and no one place has more than two or three species. Likewise Australia. Then there is Papua New Guinea which has literally hundreds of species to discover and quite possibly you could even discover your own 'new to science' species if you looked deep enough into some of the hitherto uncharted forests and alpine ranges. There are some drawbacks to PNG though, including its remoteness and the likely difficulty in travelling to the really interesting locations. I would put PNG in the 'if I ever wanted to go commando and lose myself for a year' category.

As you may have already discerned from the title, I have my own preferred tree fern Mecca and my wife Cate and I were lucky enough to visit Mount Kinabalu in Borneo in 2006.

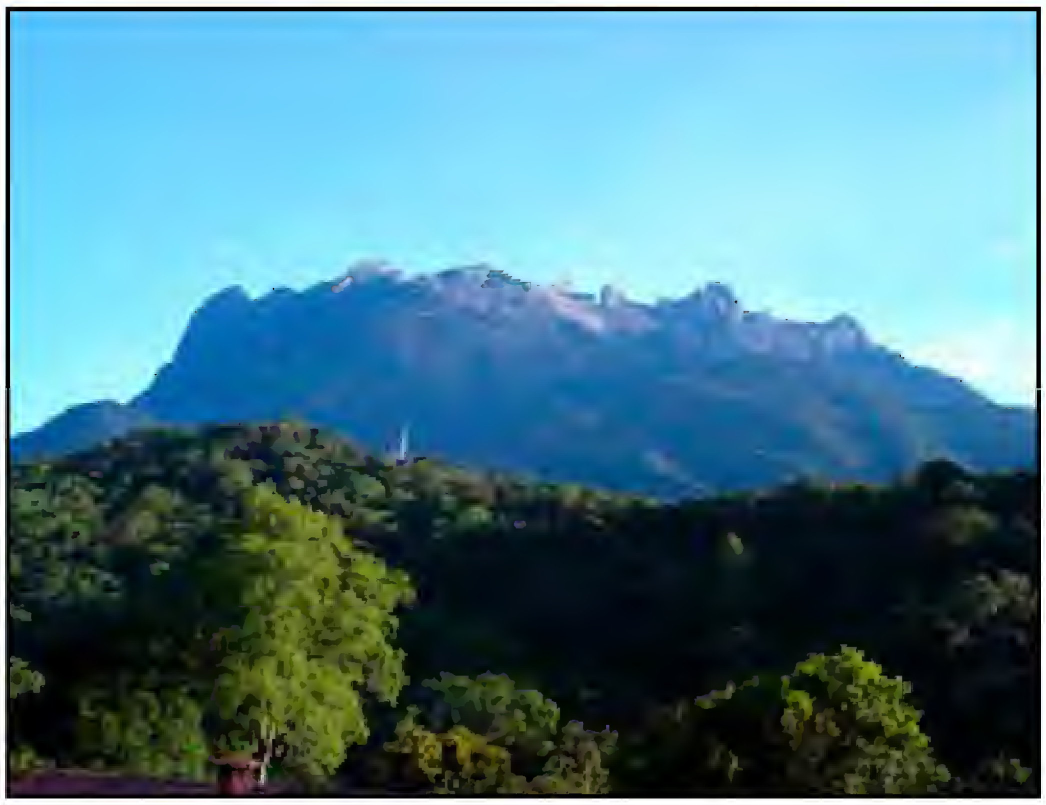

Fig. 1. Mount Kinabulu from the park HQ

Despite being a fully diagnosed tree fern enthusiast at that time, our primary reason for going there was actually to scale the peak of the mountain. The tree ferns were barely a passing thought in my mind (no, seriously!). It wasn't until Steve Pope, another certified tree fern addict kindly sent me a book titled '*The Plants of Mount Kinabalu Part 1 – Ferns and Fern Allies*' (ISBN 0947643389) that I started to appreciate quite how much fern diversity exists on this one mountain – a shocking 621 described species. Of this there are 22 species of *Cyathea*, 1 *Dicksonia* and 1 *Cibotium*, not to mention the dozens of species of *Blechnum*, *Diplazium* and *Angiopteris* which can also be loosely regarded as tree ferns. It is with this book and return tickets to Borneo that we set off on our adventure.

Upon arrival to a humid and mild Kinabalu National Park and after settling into the accommodation on site one is immediately drawn back out and onto the paths and tracks that surround the Park HQ. There are dozens of fern species to admire and a dozen species of tree fern ranging from the common Cyatheas such as *contaminans* and *latebrosa* to the quite awe-inspiring *Cibotium arachnoideum*. This fern still ranks as the most beautiful which I have seen. It is more of a giant ground fern than a tree fern but with fronds larger than *Cyathea medullaris*. I am happy to refer to it as a tree fern as it is in all respects other than trunk height. It is also endemic only to Kinabalu and the surrounding district which makes it even more special and worth the trip on its own.

The croziers of this monster (Fig.2) are the diameter of a football and the fronds easily over 4 metres long at the end of a 2-metre stipe. It grows a trunk up to about 1 metre high and usually forms small clumps of multiple growing points. Its preferred site is on the steepest banks of clearings where it can find more sun than most other ferns.

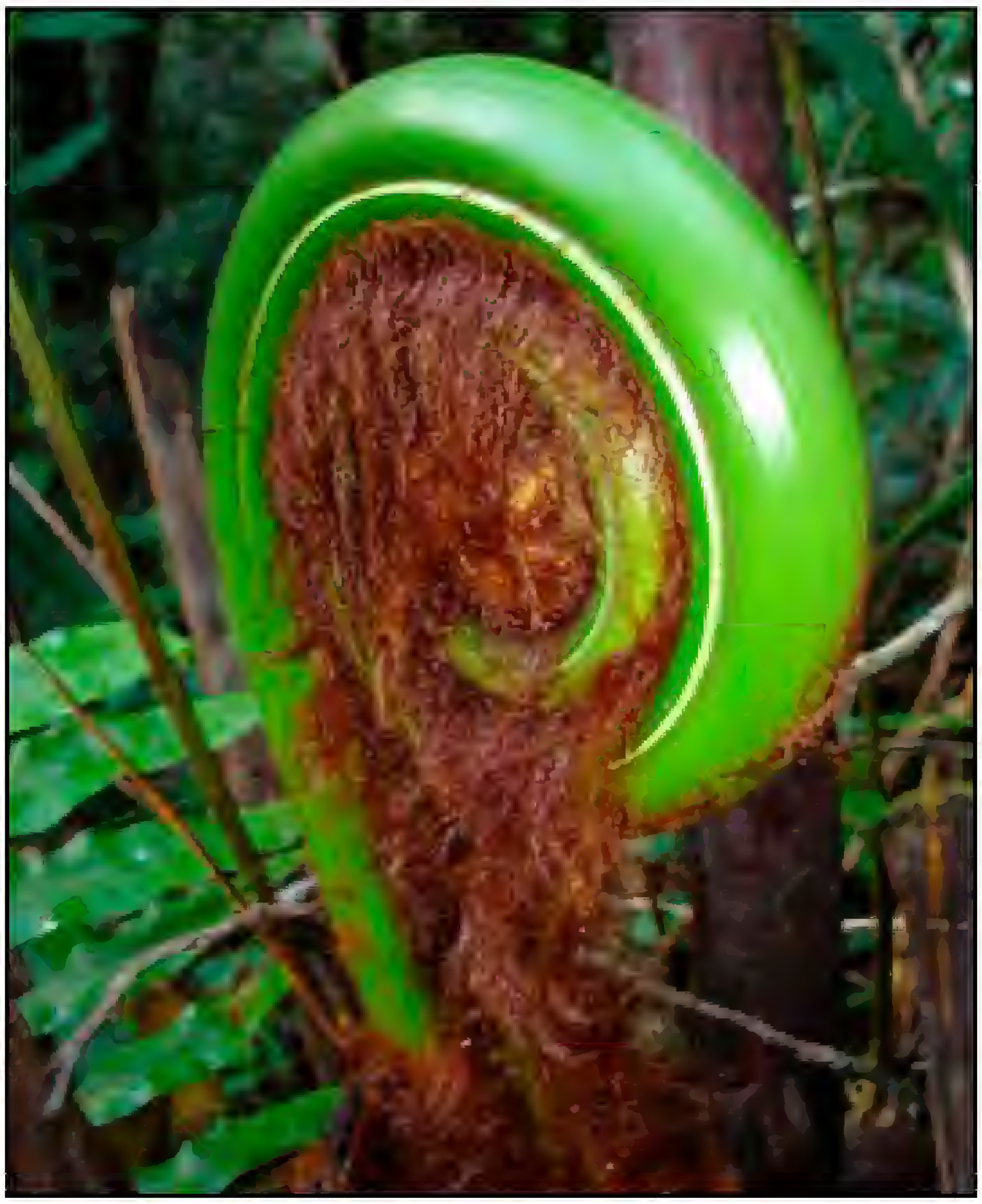

Fig. 2. Crozier of *Cibotium arachnoideum*

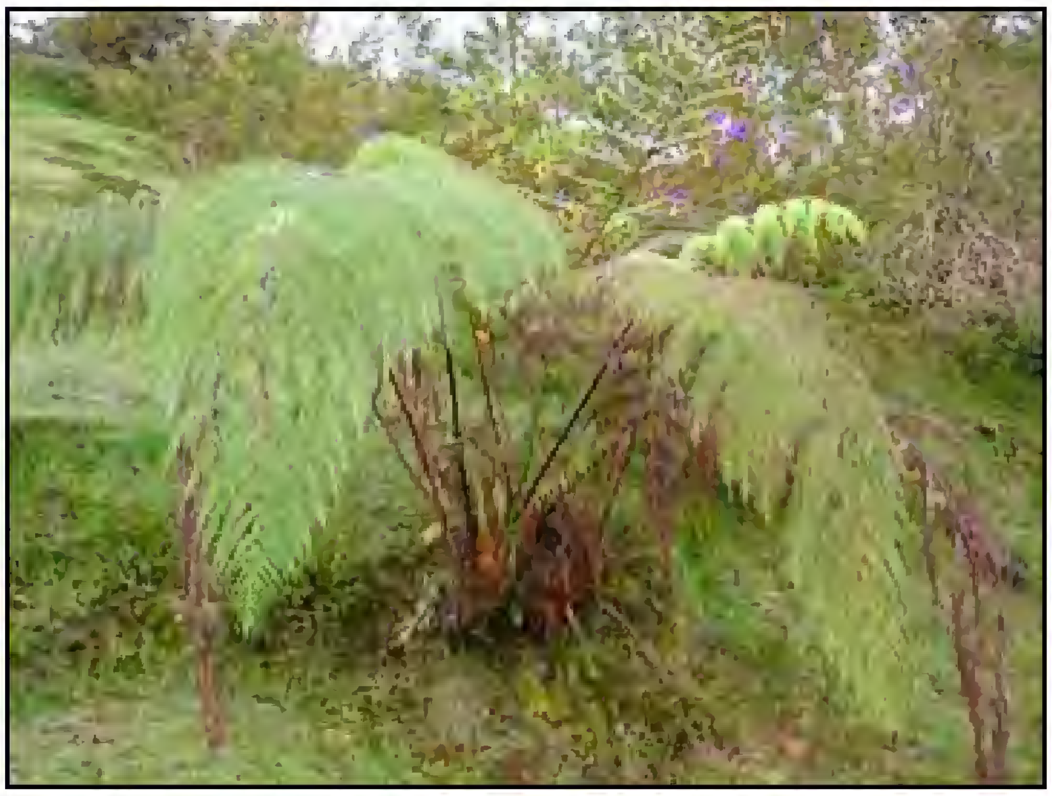

Fig. 3. 6-metre-long fronds of *Cibotium arachnoideum*

Mount Kinabalu, Borneo
Probably the Best Tree Fern Destination in the World

Fig. 4. The overnight stop before a 4am summit attempt

Fig. 5. Sunrise at the peak of Kinabalu

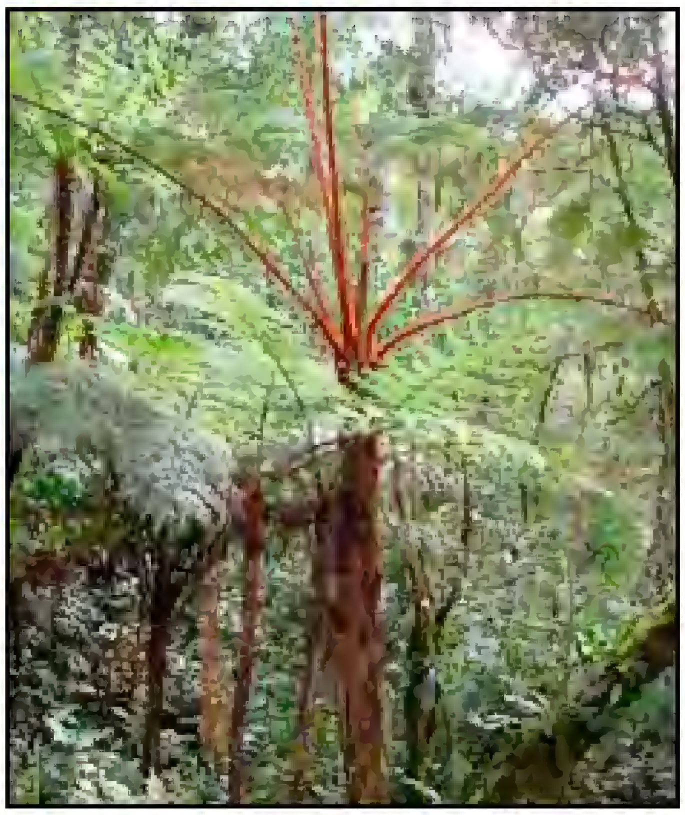
Fig. 6. A spectacular scarlet bristly haired giant with 6-metre fronds. I originally identified this as *Dicksonia mollis* due to the hairs but in every other way it resembles a *Sphaeropteris* clade *Cyathea* so who knows?

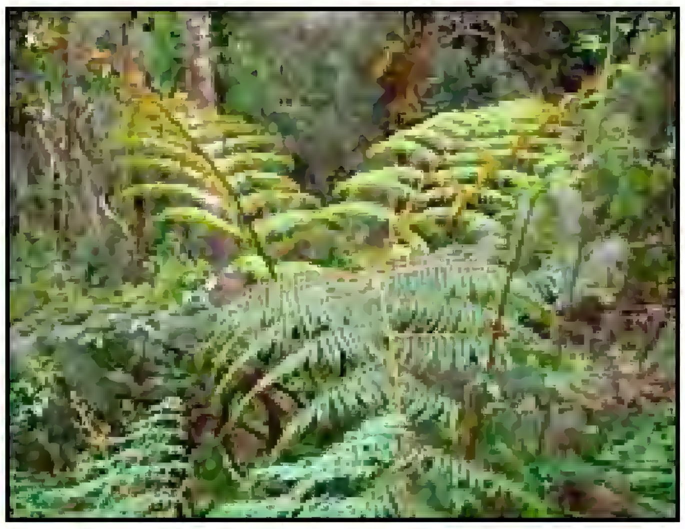
Fig. 7. This small tree fern caught my attention due to the graceful arching fronds which had a distinctively verdant green hue

The mountain can be summited and you can be safely back at park HQ in one day ready for a meal in the restaurant that evening, but very few people attempt this method. The main reason is that the air becomes thinner and oxygen in slightly shorter supply the higher one ascends from 1400 metres at HQ to over 3000 metres nearer the summit. So although the distance is relatively short, the lack of oxygen and steepness of the ascent can be very taxing. An overnight shelter is offered before the summit attempt where you can get a drink, some hot food and a bed for a short sleep before waking at 4am for the final push to see the sun rise over Borneo!

Of much more interest to tree fern lovers and general fernies for that matter too is the sheer variety and volume of different species on display on the way up the mountain. It's hard to put into words the feeling of not knowing what you will find around the next corner, but you can always be assured that you will find something new. As so many species on this mountain are found only here I could positively identify hardly any of them, even with the book, but most of the tree ferns are quite distinct and worthy of appreciation. It beggars belief that you can see so many different ferns in one day, but you really can!

Other tree fern species of particular interest are the simple frond shape of *Cyathea capitata* which grows in the most humid parts of the forest around the HQ.

Another fascinating species is *Cyathea havilandii* which we found growing in alpine scrub just before the forest disappears altogether at over 3400 metres.

You can easily spend a whole week in Kinabalu National Park admiring the diversity of plants and ferns. It is safe, the accommodation and food is excellent, the people are friendly, the tree ferns are just remarkable – what more could you wish for? Of all the places we have visited over the years to see tree ferns, nowhere else has even come close to matching Mount Kinabalu for sheer diversity and jaw dropping awesomeness! I would go back again at the drop of a hat and most certainly will sometime soon. ❐

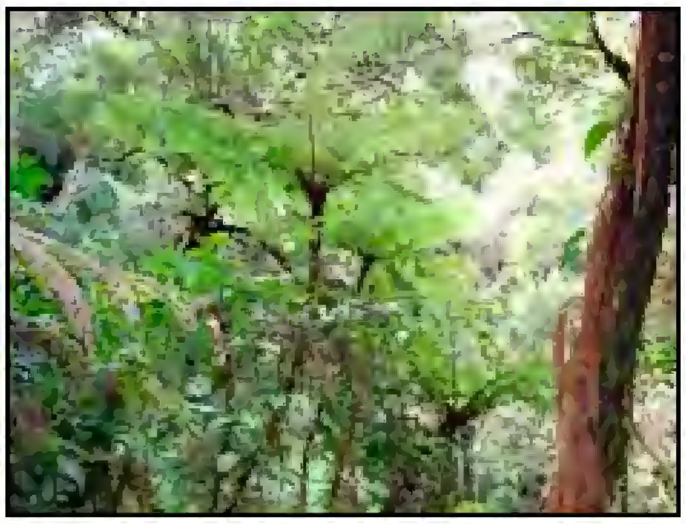
Fig. 8. *Cyathea* sp. growing in the thick dense under storey at 1800 metres

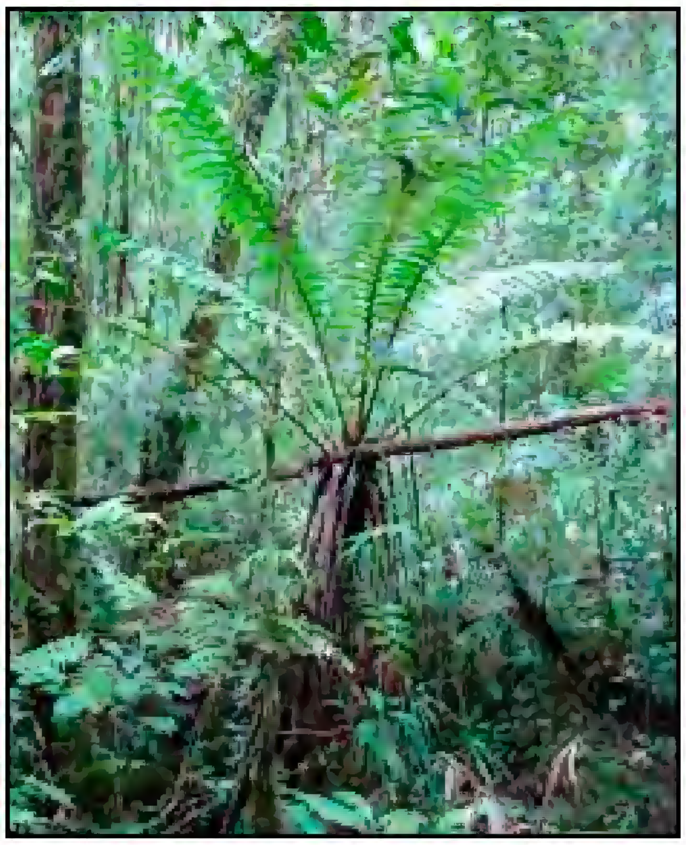
Fig. 9. *Cyathea capitata*

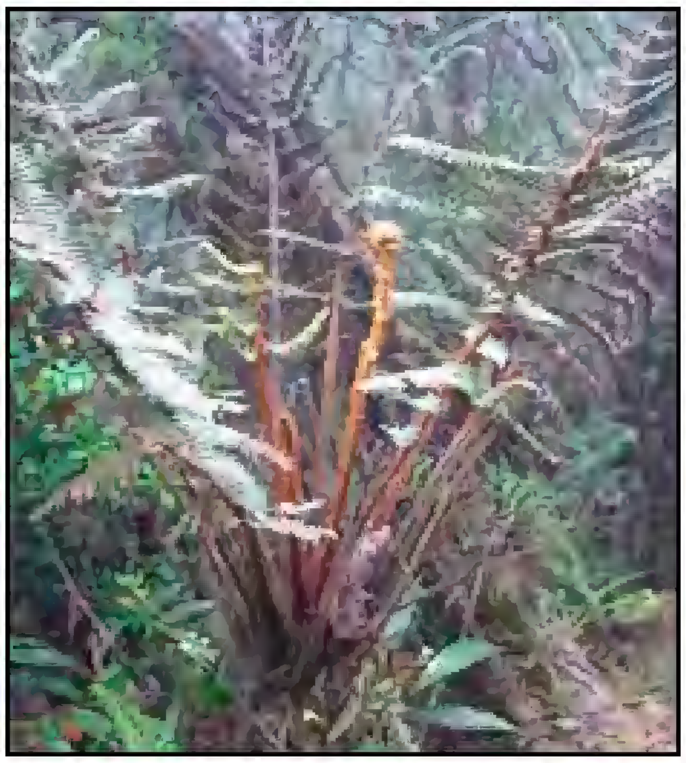
Fig. 9. *Cyathea havilandii*

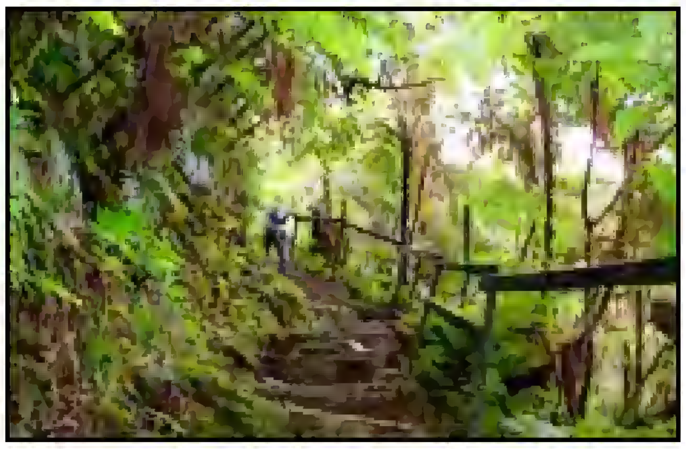
Fig.10. Cate Longley walking through fern and tree fern paradise

Cyathea kermadecensis

Mark Longley

This little known tree fern first came to my attention just last year when I found a group of three of them growing at the public fernery at Auckland Domain. It's funny how you can miss such a large and distinctive species but somehow it had passed me by on my many previous visits. The Kermadec Islands, from which it derives its name, are a group of small Islands situated about 1000km north of Auckland, probably closer to Australia but designated as New Zealand territory.

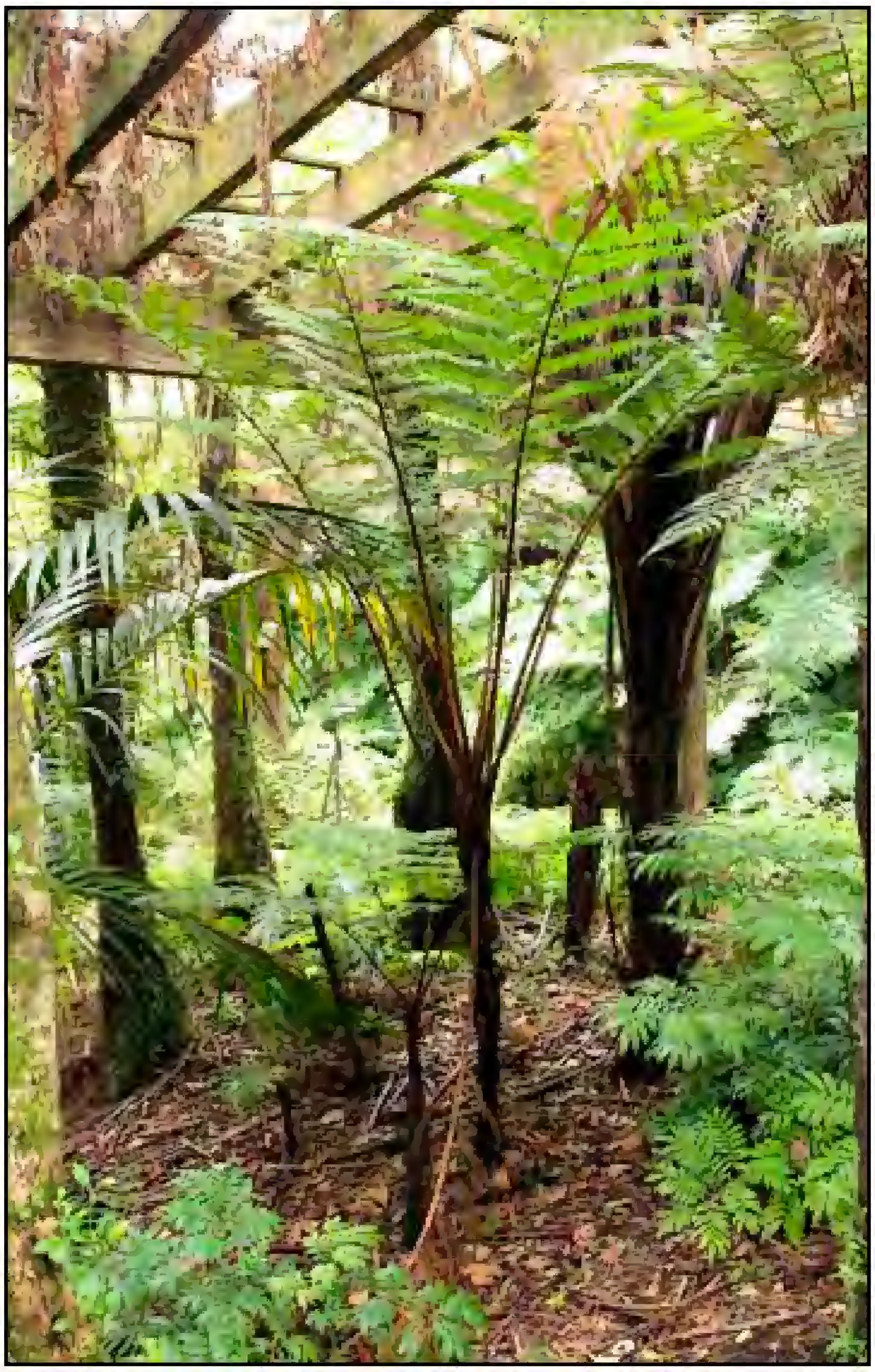

Fig. 1. *Cyathea kermadecensis* at Auckland Domain

This is a species of the *Alsophila* clade of tree ferns which typically display hard, thin woody stipes and retain the stipe bases indefinitely. However, unlike most other tree ferns of this clade, this one has extra long and narrow lance-shaped fronds. The pinnules are thin and papery to the touch and a nice deep green colour.

The trunk and apex is extremely thin relative to the size of the fronds giving this tree fern a very striking appearance. The sporadic scales are light brown and the emerging croziers are very similar to those of *Cyathea australis.*

There are a couple of smaller specimens planted underneath the main plant and my initial thoughts are that this could be a tricky species to grow and will have absolutely no wind tolerance and probably very little if any frost tolerance either. For this reason I would not get too excited about growing this one in your temperate garden just yet. It is nonetheless a beautiful species and I will try and harvest spore for the society's spore exchange should it ever decide to produce some fertile fronds. ❐

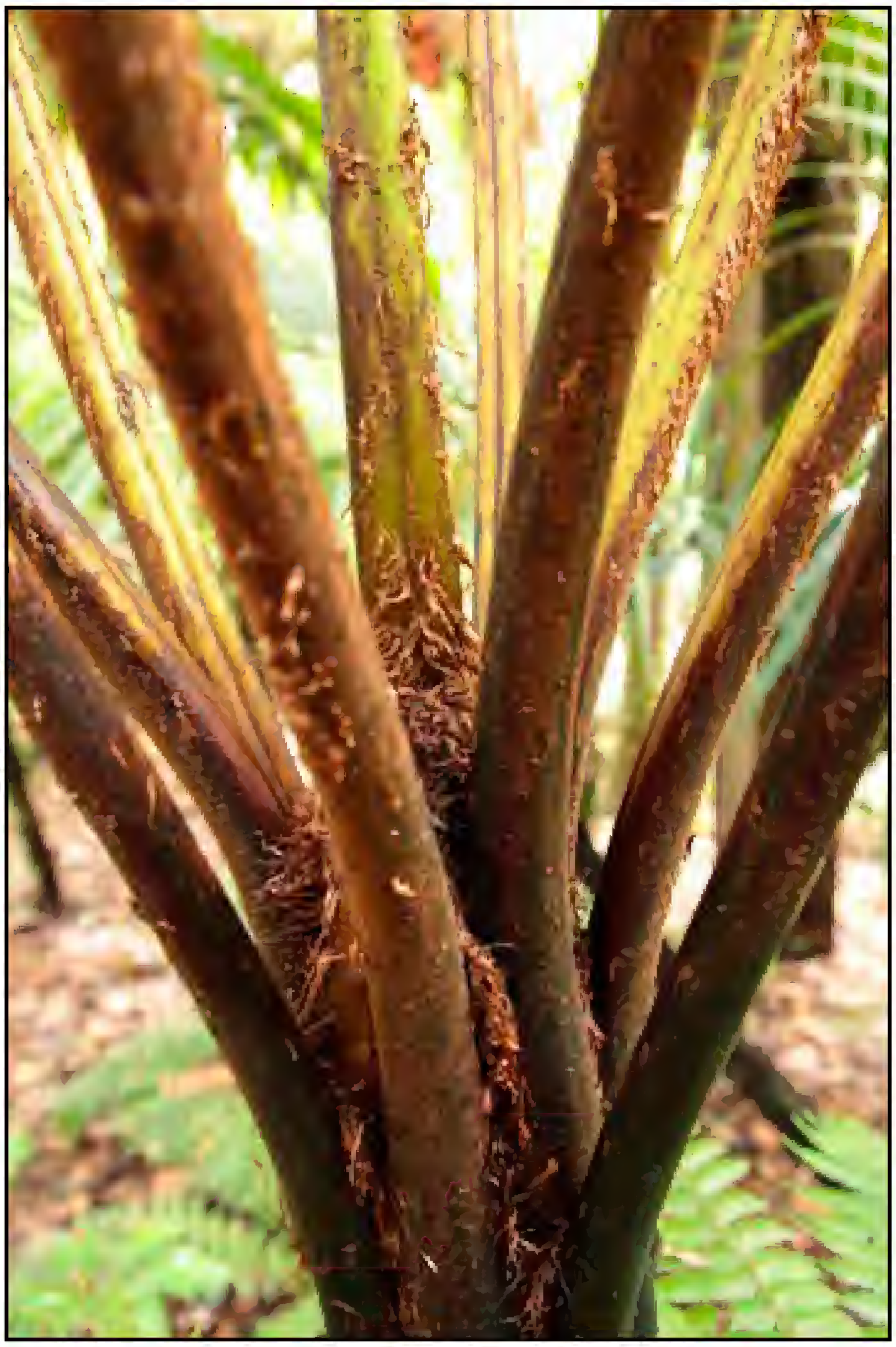

Fig. 2. Apex of *Cyathea kermadecensis*

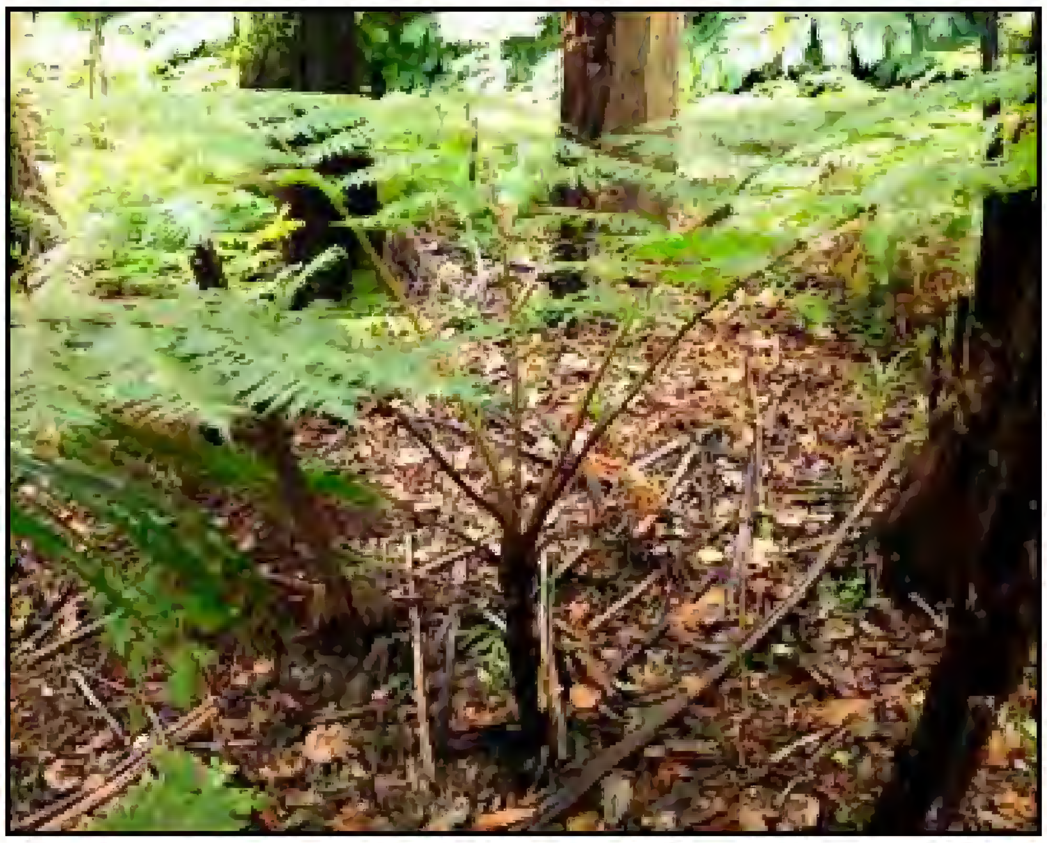

Fig. 3. One of the two smaller specimens

Two recently described *Dicksonia* from New Caledonia

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The 20-25 species of *Dicksonia* tree ferns occur in Central and South America, Malesia[1], Australasia, some western Pacific Islands, and Saint Helena island. This article recalls my peripheral involvement in the recent description by Noben & Lehnert (2013) of two new species of *Dicksonia* tree ferns from New Caledonia.

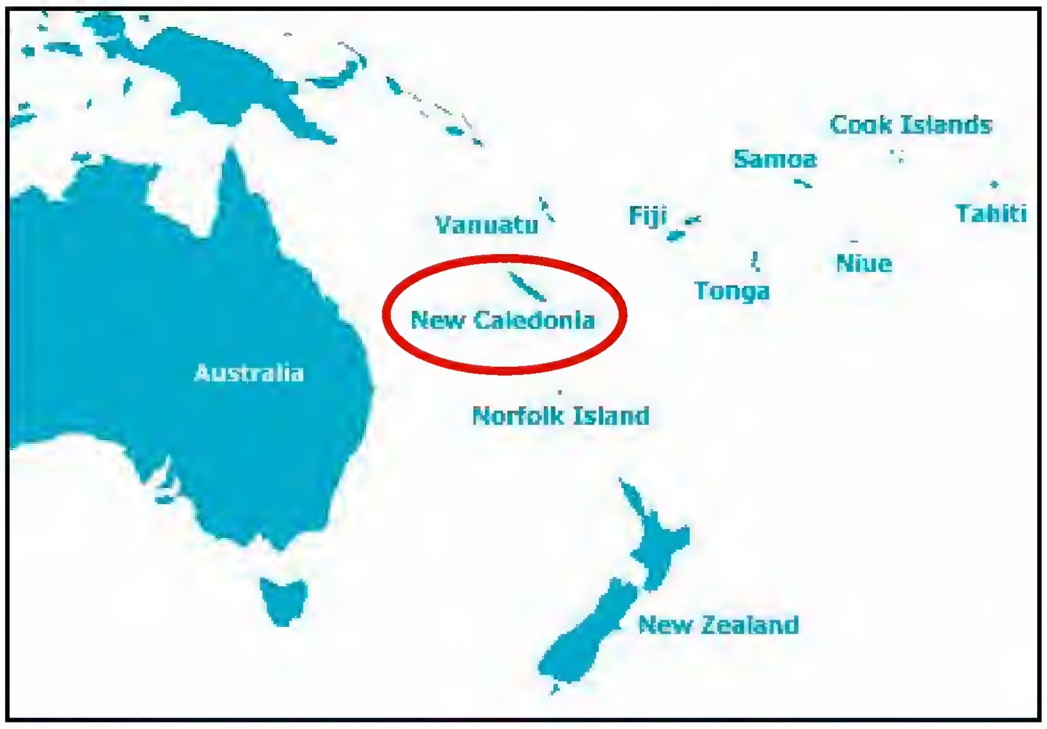

Fig. 1. Map showing the general location of the islands of New Caledonia

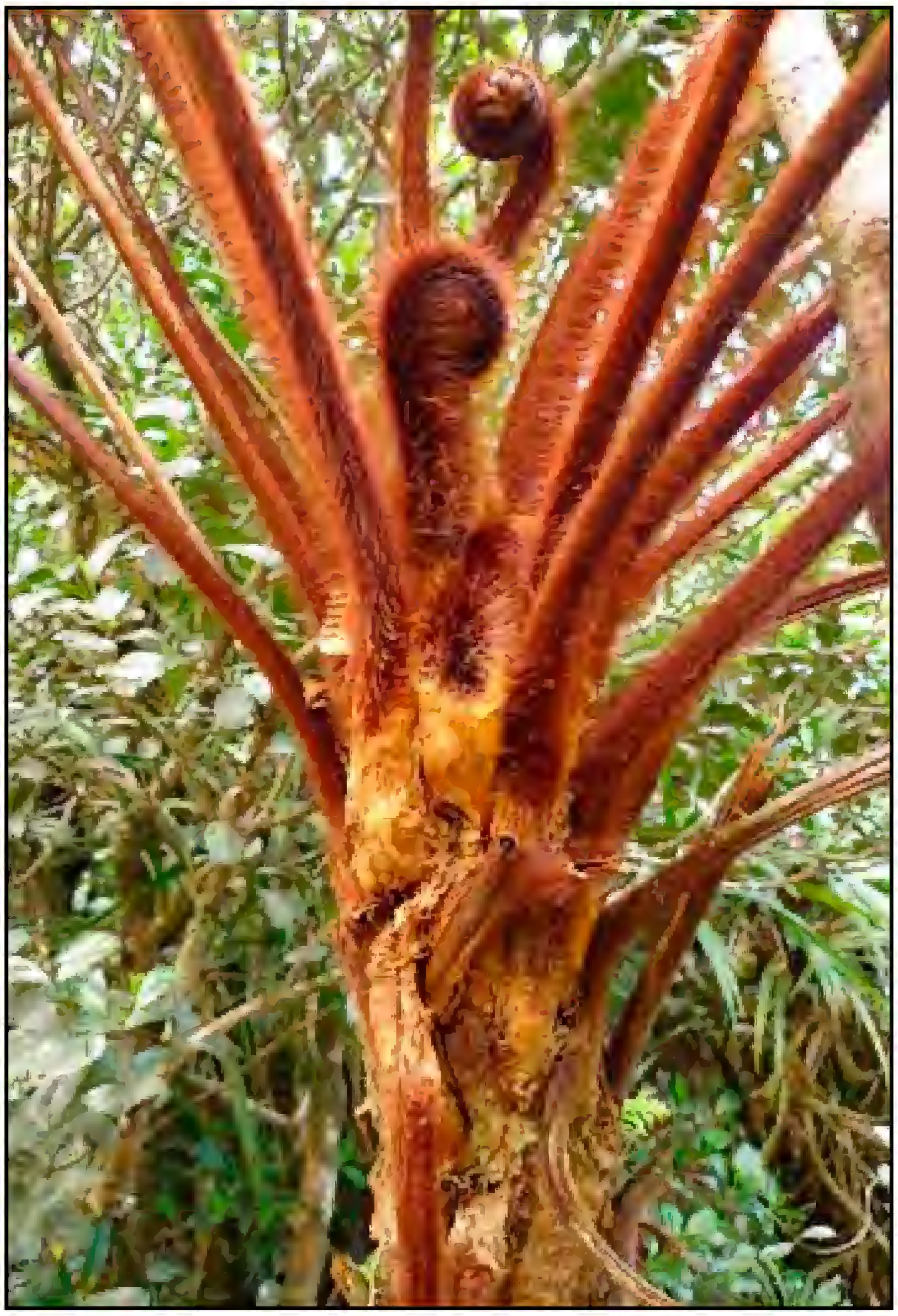

Fig. 2. *Dicksonia baudouinii*

I was fortunate to participate in a plant-collecting expedition to New Caledonia in September-October 2012. The trip was led by Matt von Konrat of The Field Museum and French botanist Louis Thouvenot. The expedition was focused on liverworts, mosses, and lichens, while I tagged along to collect those spore-producing vascular plants, ferns and lycophytes.

New Caledonia is a Special Collectivity of France, in the western Pacific. Geologically, it is part of the largely submerged continent Zealandia, which also includes New Zealand. New Caledonia is a biodiversity hotspot, with a diverse and highly-endemic flora (Morat *et al.* 2012; Pillon 2012).

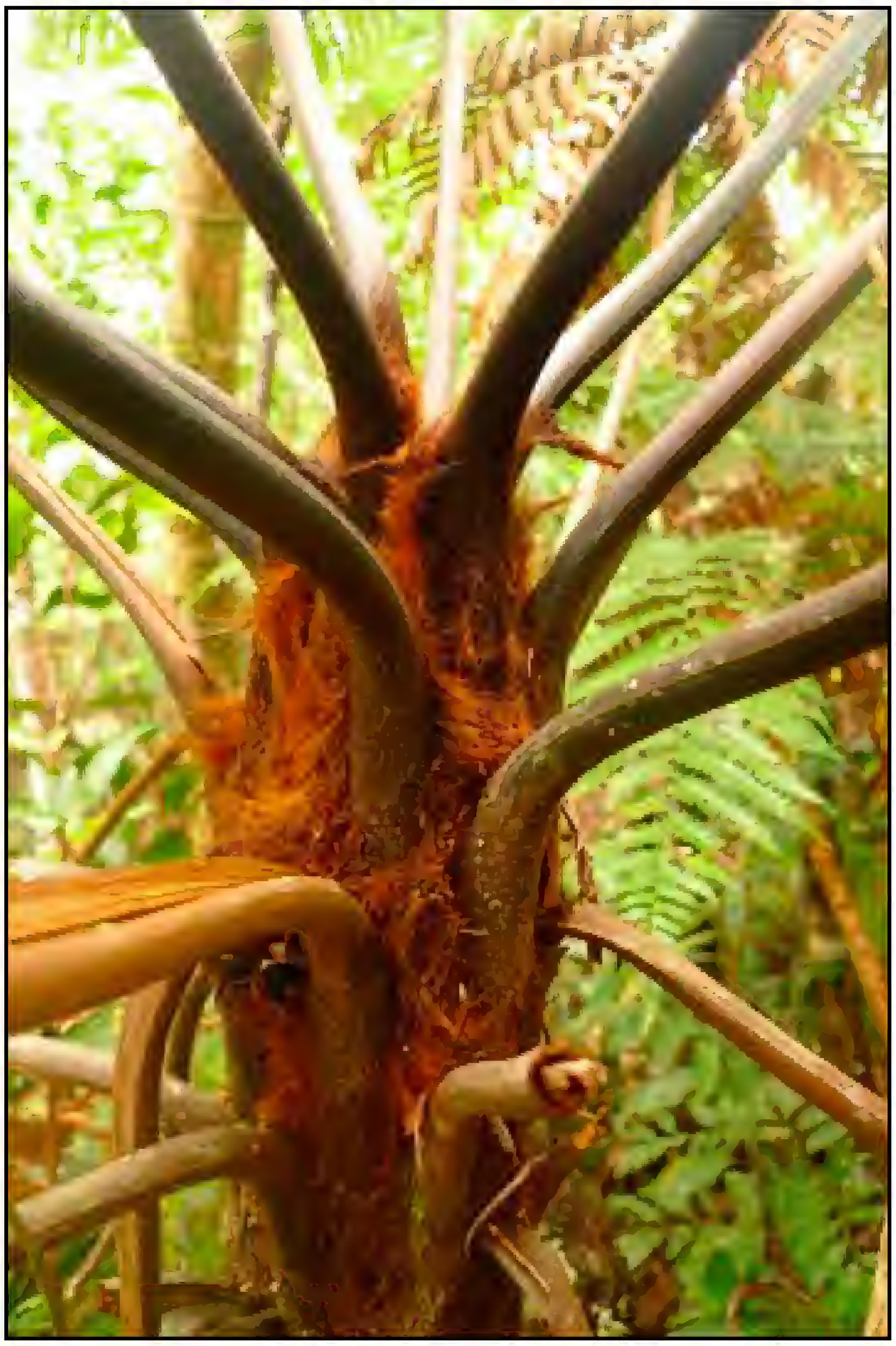

Fig. 3. *Dicksonia thyrsopteroides*

New Caledonia is fortunate amongst Pacific Islands to have a Flora of its ferns, authored by Garth Brownlie (1969). Brownlie recognised 244 species of ferns and lycophytes. Subsequent work has seen this climb to about 270 (Morat *et al.* 2012).

My aim during the expedition was to collect a specimen of each fern and lycophyte species that I encountered for the WELT herbarium of the Museum of New Zealand Te

Papa Tongarewa. Duplicate herbarium specimens were made for the NOU herbarium in New Caledonia. I also collected a subsample in silica gel for DNA analysis. During our three weeks, I collected 232 specimens of about 160 different species. On my return, I summarised the expedition's experiences, albeit with a heavy fern bias, in a series of blog posts (Perrie 2012a-e). Field photographs of the specimens are available from the museum's website (http://collections.tepapa.govt.nz/search?searchTerm=new+caledonia+fern&scope=all&imagesOnly=true).

The specimens have contributed to our ongoing work with the ferns of the western Pacific (e.g., Brownsey & Perrie 2011; von Konrat *et al*. 2011). This has included completing the transfer of New Caledonian *Sphenomeris* to *Odontosoria* (Perrie *et al*. 2014a), and a molecular analysis of relationships in the Blechnaceae, which concluded with the transfer of *Doodia* and *Pteridoblechnum* to *Blechnum* (Perrie *et al*. 2014b).

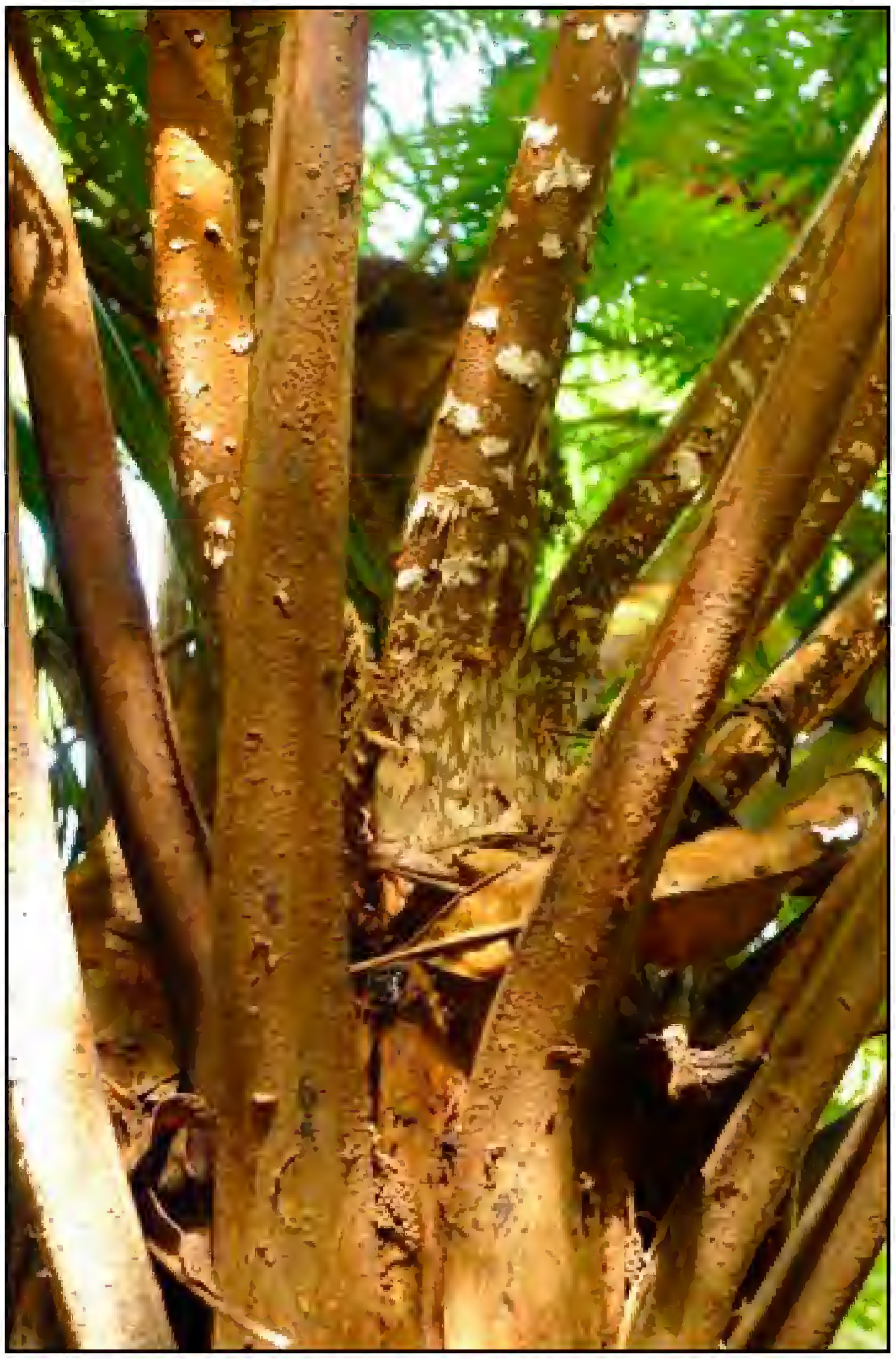

Fig. 4. *Dicksonia munzingeri*

As for *Dicksonia*, Brownlie (1969) listed two species, both New Caledonian endemics: *D. baudouinii* (Fig. 2) and *D. thyrsopteroides* (Fig. 3). Before I left for New Caledonia, I was aware from the www.endemia.nc website of a third, as-then-undescribed species (Fig. 4). This website is an excellent compilation of New Caledonia's flora and fauna, and pictured all three *Dicksonia* species.

I had collected all of the above three species by the mid-point of the trip. Towards the end of the expedition, we climbed Mont Pánie, the highest mountain on the main island of Grande Terre, at 1629 m above sea level. From about 1100 m above sea level, I was very surprised to find a *Dicksonia* that was clearly different from the other three species, noticeably in the width and indumentum of its stipes (Fig.5). This fourth species was abundant at higher elevations on Mont Pánie. At the end of our trip, I had the opportunity to briefly examine the NOU herbarium in Nouméa. It was readily apparent that I was not the first to recognise the fourth *Dicksonia* species, which was not surprising given its distinctiveness However, I could not find any published reference to it.

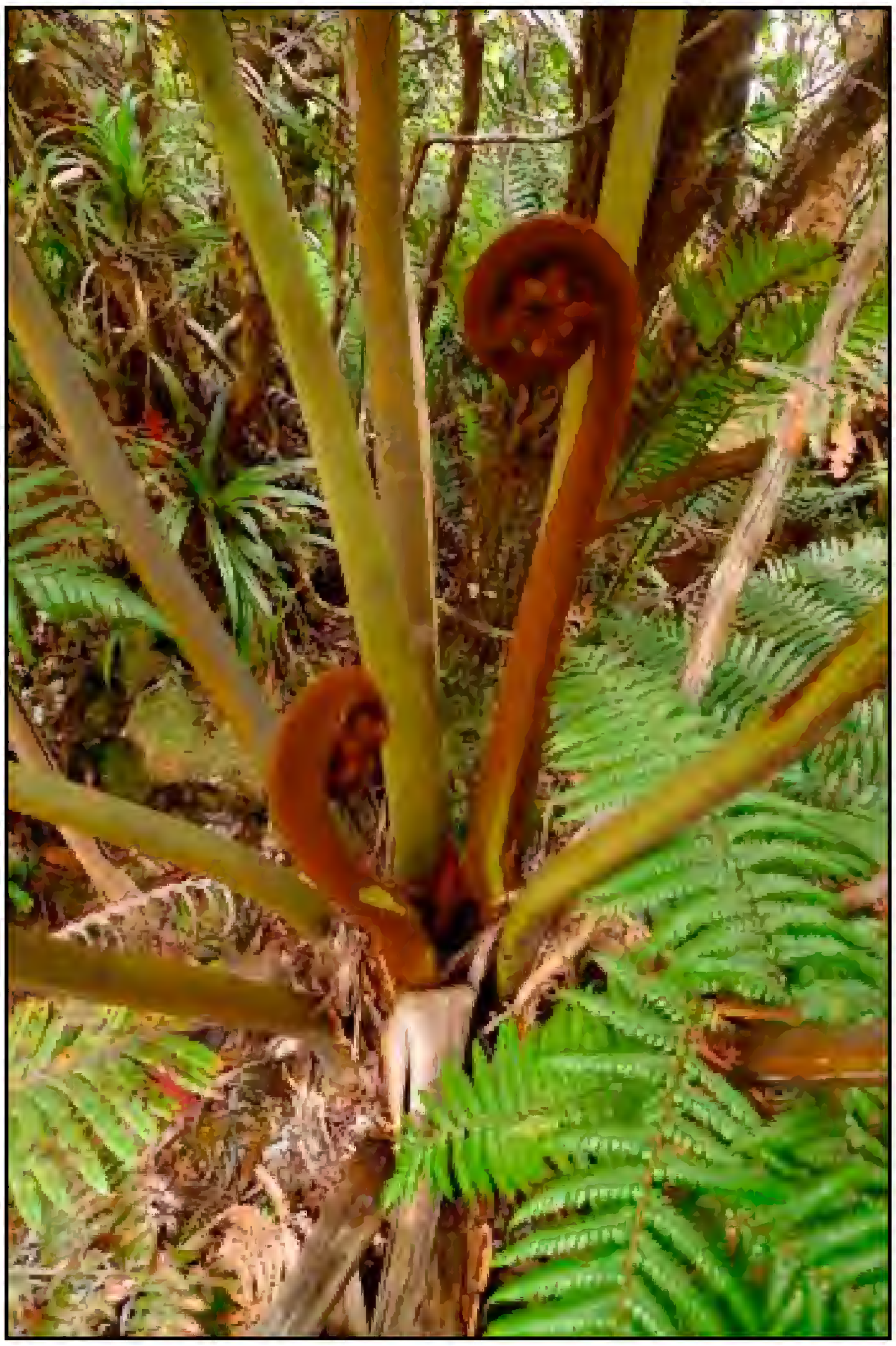

Fig. 5. *Dicksonia perriei*

On my return home, I contacted Marcus Lehnert, University of Bonn, whom I knew to be interested in tree fern taxonomy. He had a MSc student, Sarah Noben, working on Pacific *Dicksonia*. I suggested to Marcus that there was not one but two undescribed *Dicksonia* species on New Caledonia, and I sent him all of my photos. My museum colleague, Lara Shepherd, also sent DNA sequences from the samples I had collected.

In late 2013, Sarah and Marcus published a paper revising *Dicksonia* in the western Pacific (Noben & Lehnert 2013). Included was the description of two new species from New Caledonia. The species that had been pictured on the endemia website was named *Dicksonia munzingeri* (Fig.4), after Jérôme Munzinger, an expert on the New Caledonian flora. I was very surprised (and chuffed) to find that the species I had seen on Mont Pánie had been named after me, *Dicksonia perriei* (Figs.5 and 6). As has since been noted, the etymology of this squat, chubby and hairy tree fern was particularly apt in regard to physical characteristics!

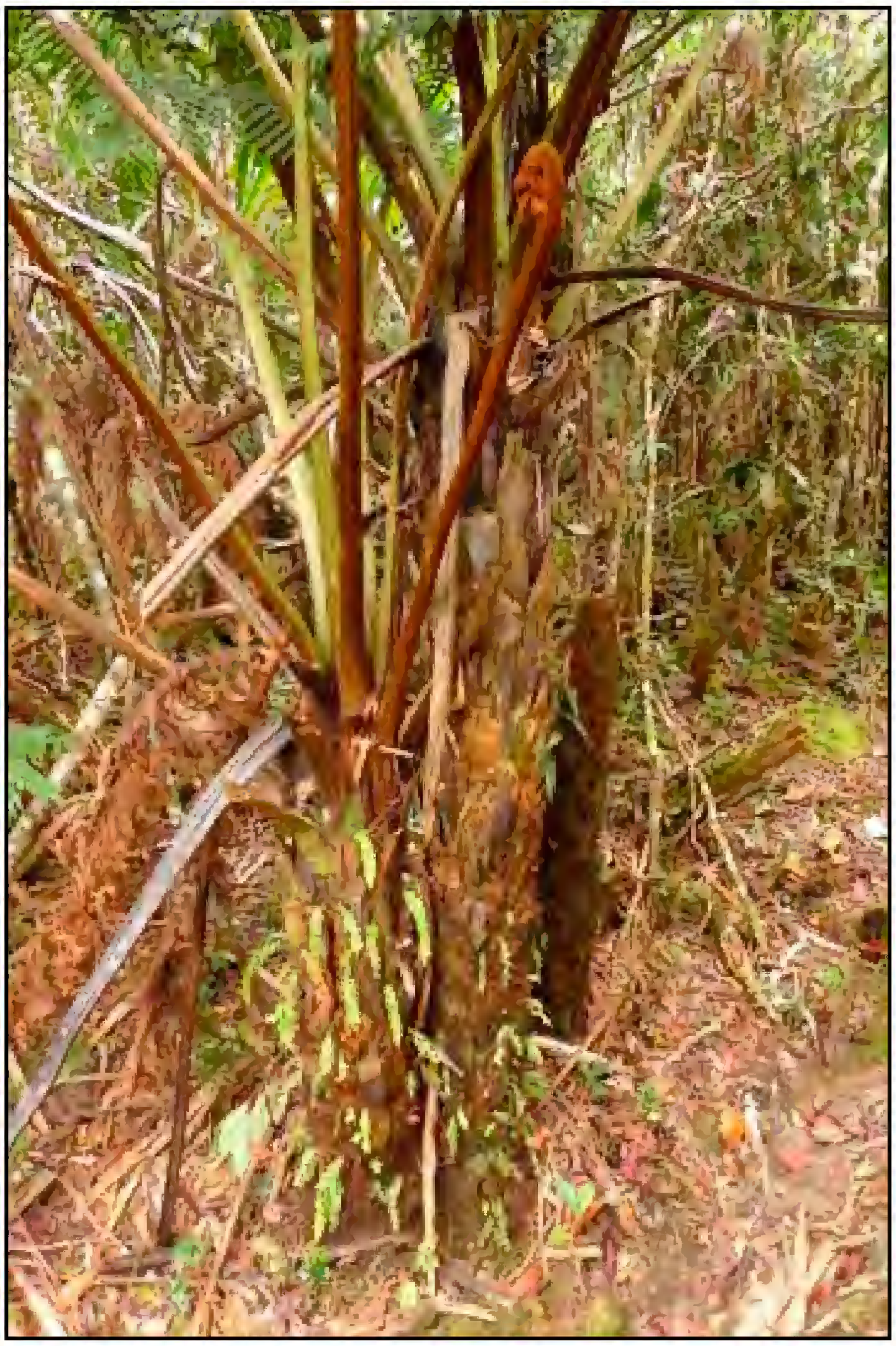

Fig. 6. *Dicksonia perriei*

That two big tree ferns have remained undescribed for so long may be surprising. However, an abundance of basic pteridological research remains to be done in the Pacific. Though the landmass is comparatively tiny, the Pacific Islands are still home to close to 10% of the world's ferns and lycophytes, and many are still to be described. ❐

Acknowledgements:

Thanks to Matt von Konrat and Louis Thouvenot for organising our New Caledonian trip, and to Sarah Noben and Marcus Lehnert for their work on Pacific *Dicksonia*.

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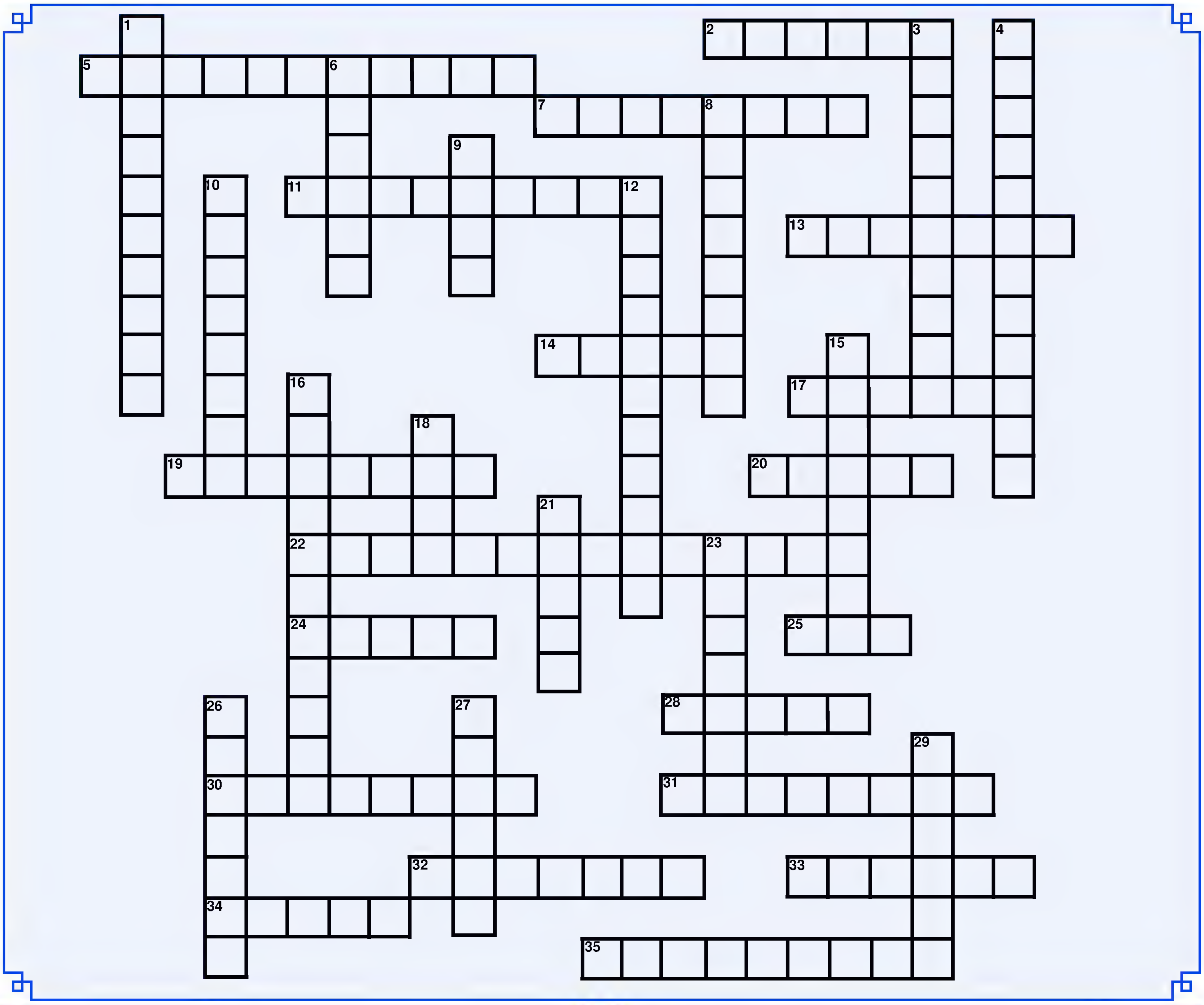
[1] **Malesia** is a biogeographical region straddling the Equator that includes the Malay Peninsula, the Malay archipelago, New Guinea, and the Bismarck Archipelago

Tree Fern Crossword

Complete the crossword below to test your tree fern knowledge



Across

2. Grow your own from these (6)
5. Rare *Dicksonia* sp. from St Helena (11)
7. Tree ferns love this! (8)
11. One of the *Cyathea* clades (9)
13. *Cyathea* sp. from Norfolk Island (7)
14. Tree ferns hate this! (5)
17. Home of *Cibotium glaucum* (6)
19. *Dicksonia anatarctica* grows here (8)
20. The defining characteristic of a tree fern (5)
22. Meaning 'very hairy' (14)
24. Common name in N.Z. for a tree fern (5)
25. Famous Victorian glass houses (3)
28. Empty spore cases (5)
30. Family of small trunking ground ferns (8)
31. Leaflets (8)
32 Spore bearing fronds (7)
33. The Maori name for *Cyathea medullaris* (6)
34. Supports the frond (5)
35. Twice divided (9)

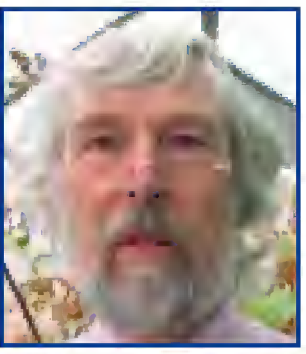
Down

1. Wrap this around your trunks in winter (10)
3. *Dicksonia* sp. from South America (10)
4. *Blechnum* sp. named after a cycad (12)
6. *Cyathea* has these but not *Dicksonia* (6)
8. *Cyathea* sp. whose fronds have silver undersides (8)
9. Apical region of a tree fern (4)
10. Rare Australian *Cyathea* sp. (8)
12. Family of giant tropical ferns (11)
15. Trunk forming *Blechnum* sp. (8)
16. The first stage of growth (11)
18. Ready to be harvested (4)
21. Tree ferns need these to grow (5)
23. The most southerly *Cyathea* sp. tree fern (7)
26. Meaning 'fibrous' (7)
27. A tropical *Dicksonia* sp. (6)
29. The Royal *Cibotium* (6)

Answers on the website (http://ebps.org.uk), or send a S.A.E. to the editor at Pear Tree Cottage, Burton-in-Kendal, Cumbria. LA6 1NN
An on-line version of this crossword is also available on the website to save you having to mark your magazine.

Some Personal Observations on Growing *Cyathea cooperi* in a Cold Climate

Pat Acock
13 Star Lane, St. Mary Cray, Kent. BR5 3LJ
e-mail: pat.acock@btinternet.com



I have seen *Cyathea cooperi* on many occasions around the world and realise that it is a pan tropical/sub-tropical weed. I hope to write more on fern weeds next year. One can often see tree-ferns' spores on spore exchanges but since the spores are very short lived it is usually a waste of time sending for them. However as we were pulling out sporelings on a subtropical Island, I knew that there was no harm in me taking a vast number of spores from a large frond of *Cyathea cooperi*.

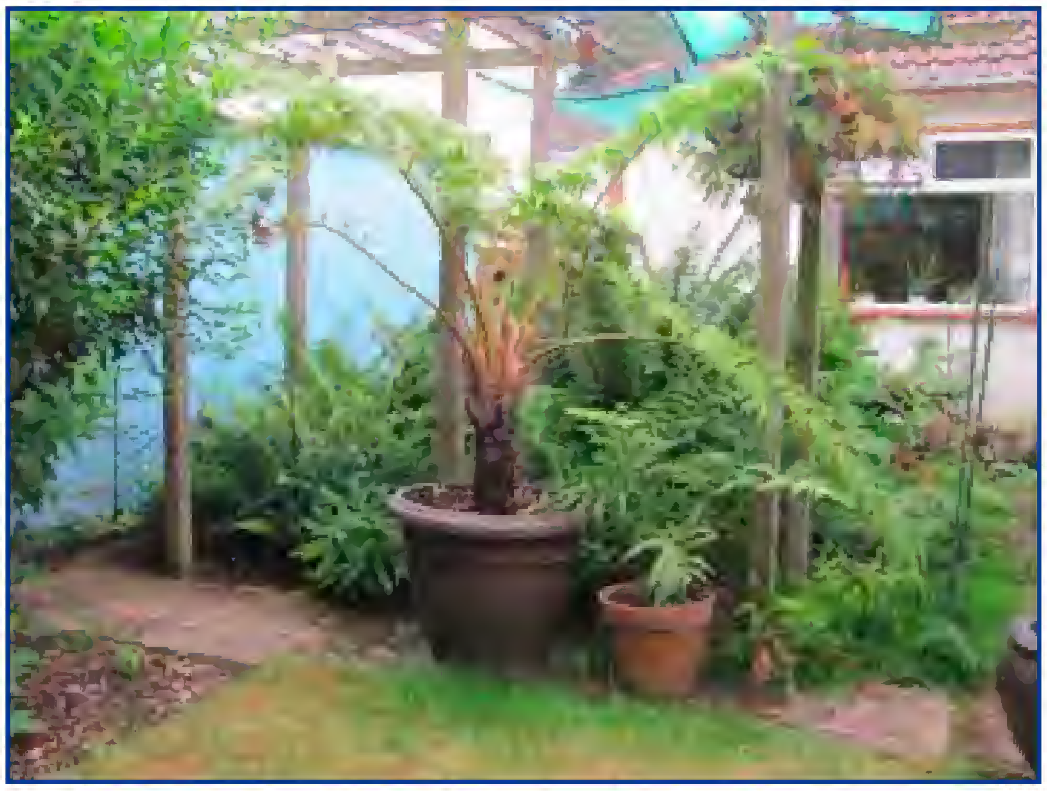


Fig. 1. Scruffy appearance of the fronds on removal after overwintering in the greenhouse

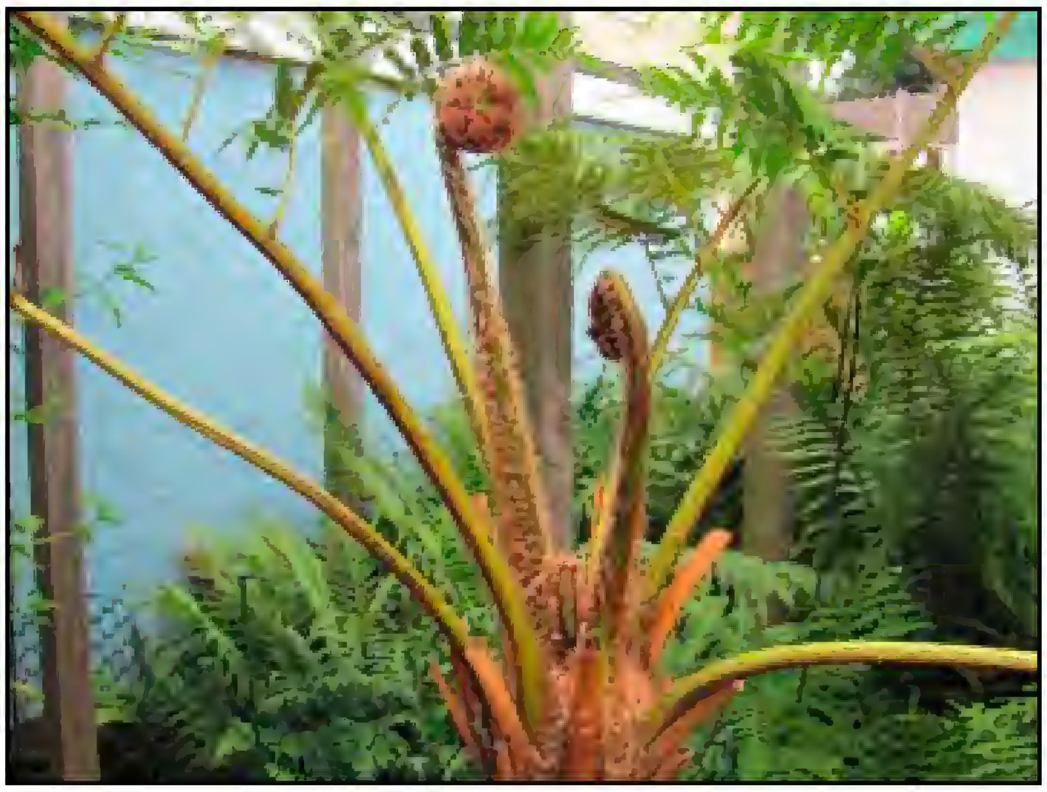


Fig. 2. New fronds opening quickly in early July 2013 with rising light and warmth

Sowing them immediately I returned, I had little hope from past experiences of them germinating. How wrong you can be; they came up like *Asplenium marinum* and *A. billotii* or perhaps I should have said mustard and cress. I had so many that I did not know what to do with them and even with my usual lack of care I still ended up with many 4" and 8" pots of them. I was eventually left at the end of the summer with 3 of the larger pots with 12" to 15" sporelings. They really grow fast! I transferred one to a 10" pot keeping it in the greenhouse maintained at 5°C and I am afraid to say set the other 2 in the garden in a sheltered spot between a wall and the house. All 3 continued to make very good progress and being the first tree-ferns I had successfully brought into life or had not killed over their first winter I followed their progress regularly.

As November ended we had a few frosts of -2°C and I checked the outside ones. No sign of any frost burn. This went on for a week or so. And then we had a -6°C frost. Full of confidence I went to see my treasures only to discover that they were burnt as a crisp and had no chance of recovery and nor did they.

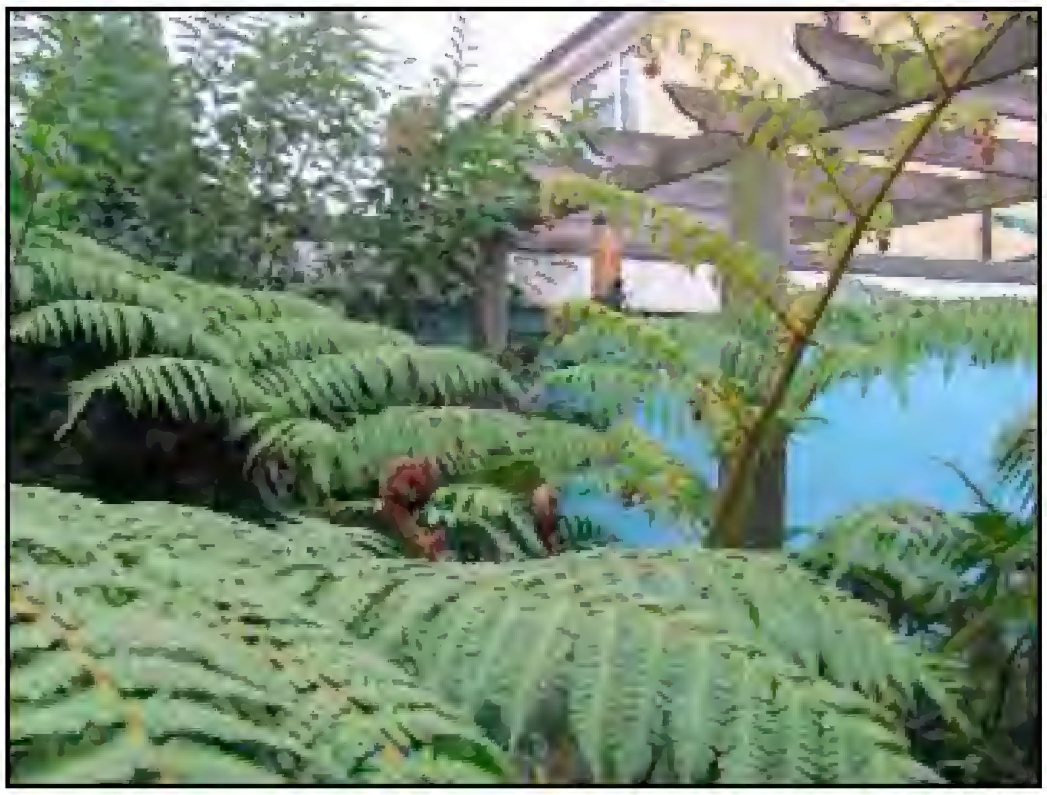


Fig. 3. Luxuriant new growth in late spring 2014 after a very mild winter. The winter damaged fronds have been removed

However the monster in the greenhouse carried on growing through the winter and on until the present day. There have been a few problems on the way. Firstly I had to buy bigger and bigger pots. No problem. Each June I would take the pot out through the greenhouse door pot first and back pot leading in October. By now it was taking up 20-30% of the space. The pot outside needed watering every day, rain or shine. During its 5th and 6th years I noticed that it always had 3-4 large fronds but once the next started opening, the oldest frond would start to die back.

I realised it had reached the limit of growth in this pot so I bought an enormous pot. Problem solved - only to create a new one. Now we had 8-10 fronds growing ever larger with each new growth but I had to take the end of the

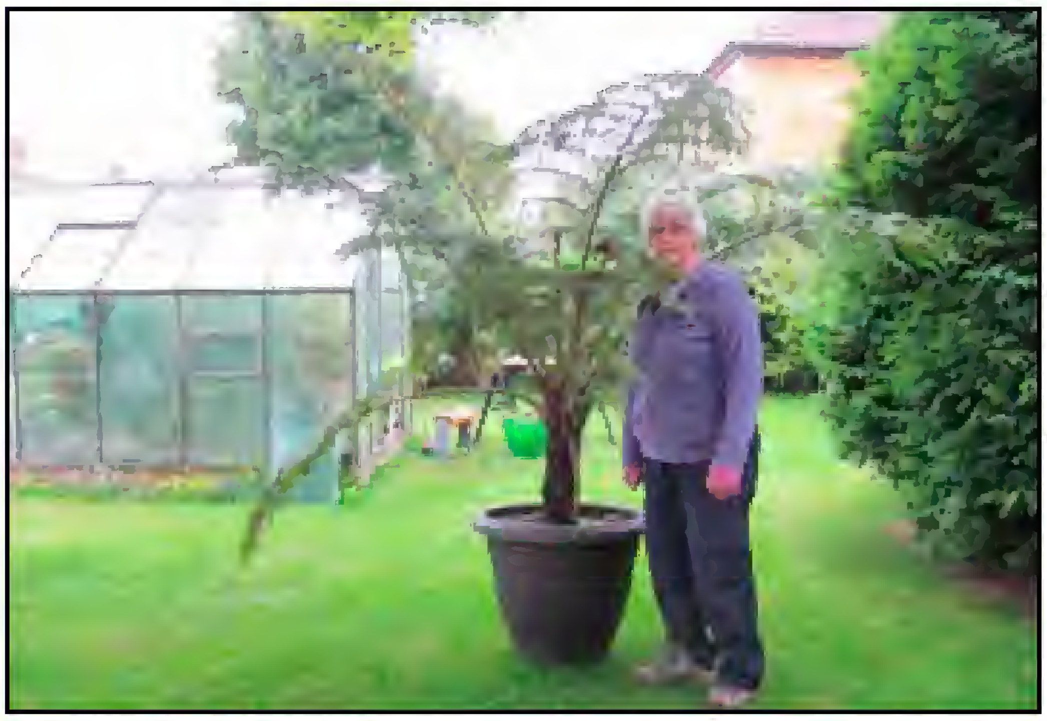


Fig. 4. Grace Acock showing the size of the plant as it was being prepared to return to the greenhouse in autumn 2013

greenhouse off each June and October to move it out and back in again which meant jacking the roof up and 3 pairs of hands to lift it up and through.

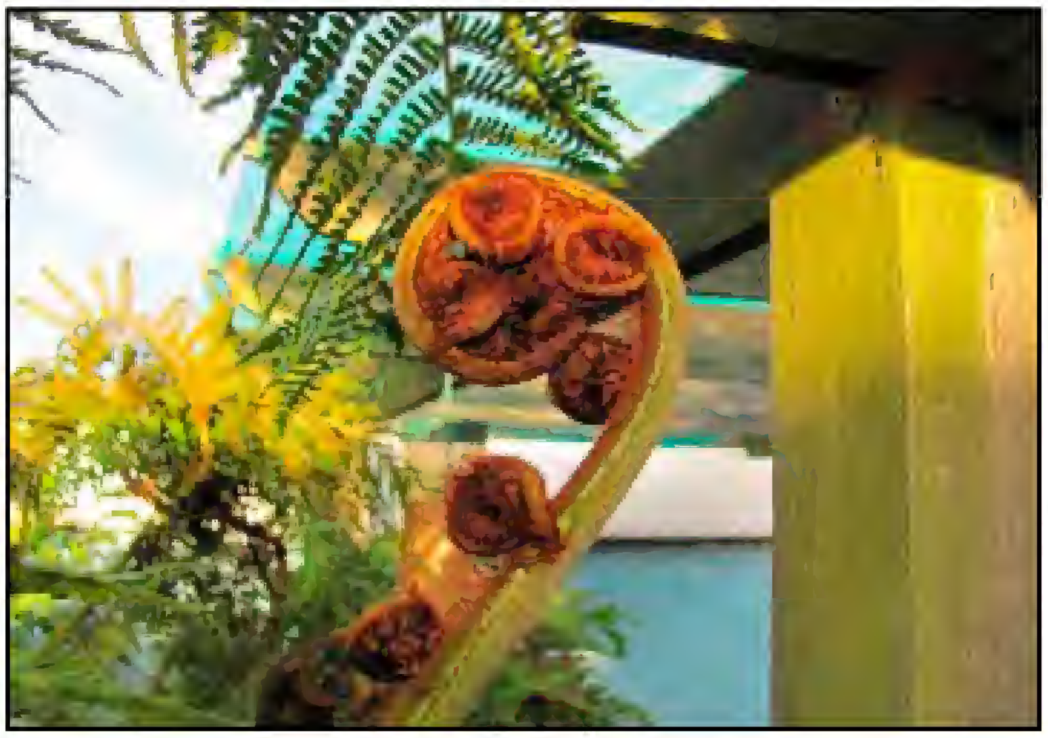


Fig. 5. Rapid growth during the mild winter of 2013-2014 shows a crozier opening close to a 3" post of 6'9" height.(2m.)

The year before last I realised I had a real problem. It was not that I could not force the monster in but forcing the tops of the fronds over to their normal position caused a lot of damage to them. This was as nothing to the second problem, the monster continued to grow vigorously through the winter into the spring when the last serious frosts could be assumed past. The new fronds pushed up onto the glass becoming distorting and occasionally being burnt by the frost outside. This meant that the newest fronds were really shabby when the plant was forced out of the greenhouse in late spring. I realised that there was no way the *Cyathea* was going back into the greenhouse this year. A few people were enthusiastic to take it, but on seeing the size always shook their heads and returned empty handed.

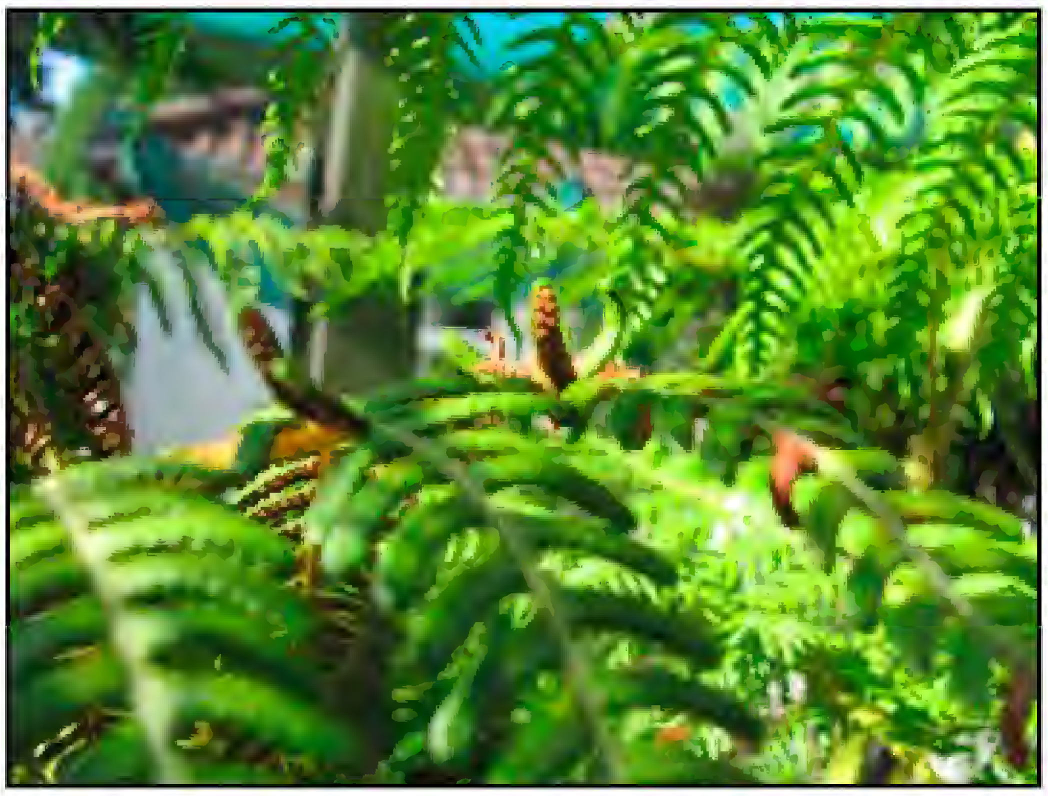


Fig. 6. The ripest pinnules starting to turn up 11 June 2014

By chance I was talking to Matt Crawford, my boss on the railway, a tree-fern enthusiast and BPS member and he said that he had the ideal solution. He keeps his tree-ferns in a lean-to with plenty of height and space at his mother's house. I was worried with how busy we have been recently with major civil engineering work on the railway that he would not arrive before we set off on the Japanese tour; but true to his word the week before we left he came around and we managed to load it onto a lorry with a number of other ferns.

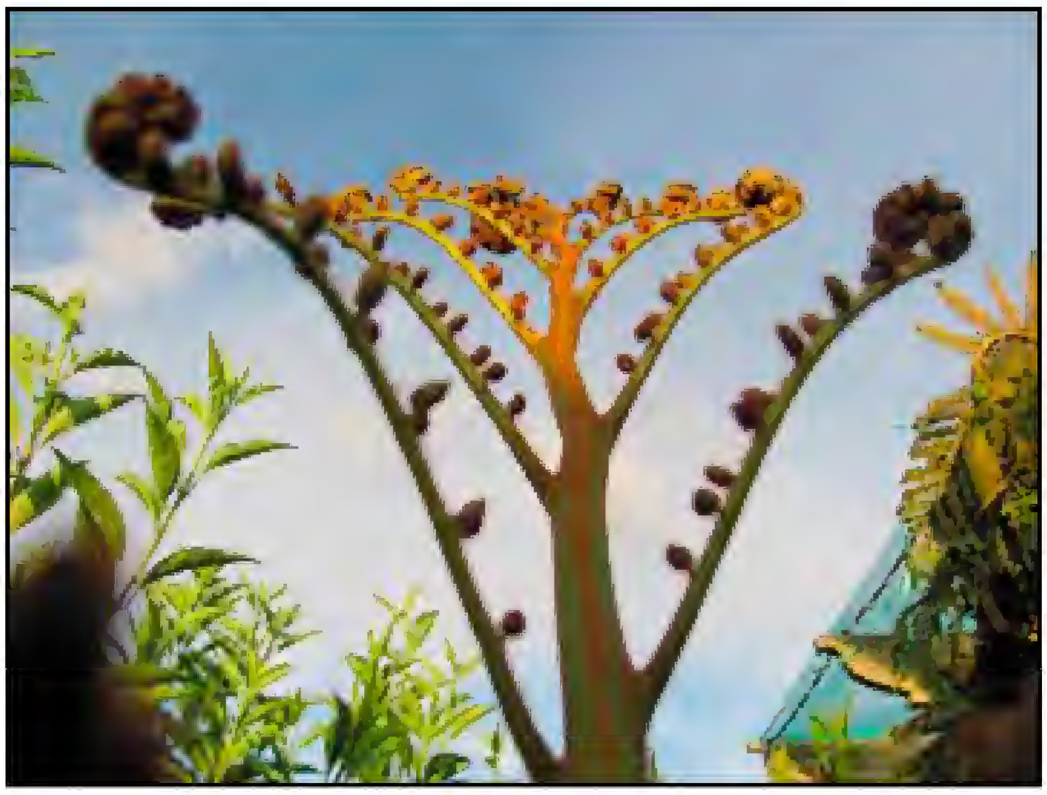


Fig. 7. New frond opening perfectly away from the constraints of the greenhouse roof 4 July 2014

To date he tells me that there is no sign of frost damage and we have been down to -9°C in the Sussex countryside, so I am hopeful that my *Cyathea* has found a new home*. I have taken some spores to start the process all over again.

One last observation. During the last 4 or 5 years the *Cyathea* has spored on every frond. I have watched the process closely and I was surprised that when the sporangia cases become ripe and show it by becoming quite glossy the pinnules turn up at right angles to the frond. I am sure that this must be a mechanism to allow the spores to disperse further by allowing the breezes to flow through the upright pinnules rather than under the frond where they would force the spores downwards. I have not found any other record of this happening but must confess to not looking very far.

*Latest report from Matt: 4 February 2015 - new croziers are starting to open.

Post note

On our brief visit in December 2014 to Big Island, Hawaii we saw this *Cyathea cooperi* with a few sporelings. It was like mine after 7-8 years and was looking luxuriantly menacing, claiming a cleared site at the start of a trail. The CSIRO Flora of Australia Vol. 48 (1998) notes 'recently reported as a serious weed of rainforests of some Hawaiian Islands'. Watch this space!

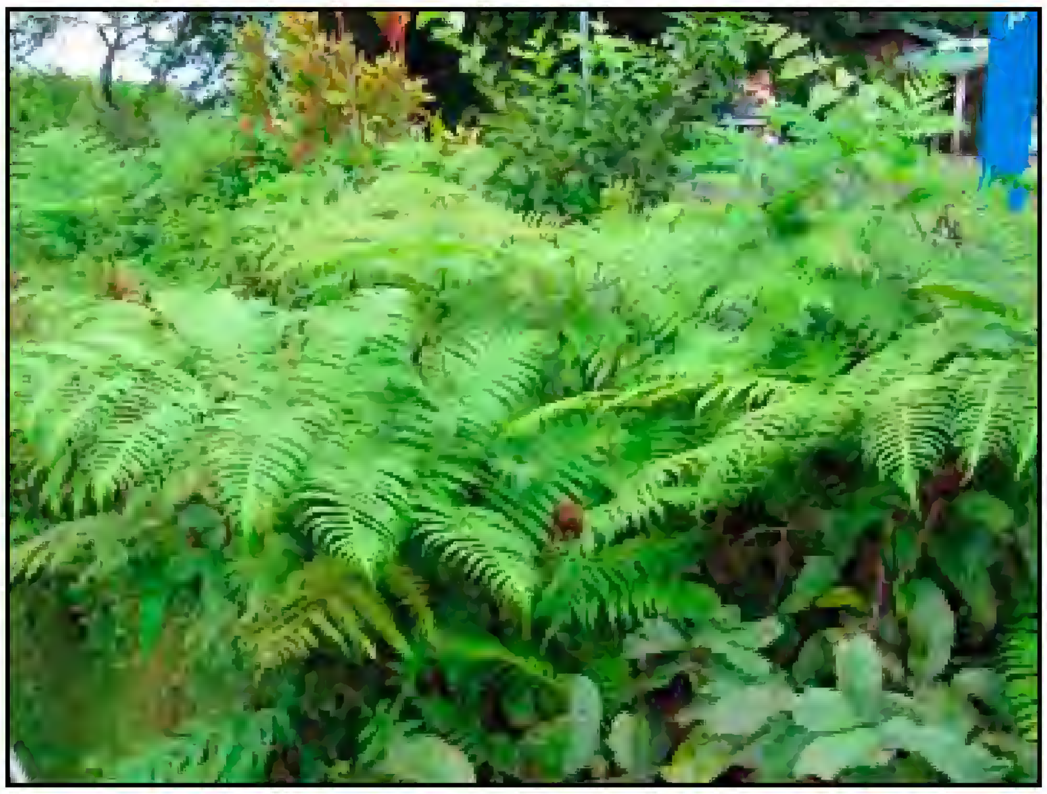


Fig. 8. A new arrival on Big Island, Hawaii

Observations on the Hardiness of *Cyathea australis*

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Having enjoyed growing *Dicksonia antarctica* and *Dicksonia fibrosa* tree ferns in my garden in the suburbs of London for a number of years, my thoughts, perhaps inevitably, turned to the possibility of their being joined by a representative of the other main tree fern genus, *Cyathea*. The cyatheas I had been growing previously were all in pots, as their limited hardiness ruled out any possibility of a permanent position in the garden. As luck would have it, it was around this time that I received advance notice from Amulree Exotics Nursery in Norfolk (sadly now defunct), of a shipment of tree ferns that was due to arrive in the UK in March 2009, and was to include trunked specimens of *Cyathea australis*.

Cyathea australis is generally considered the hardiest *Cyathea* species and whilst I had read various reports suggesting it was hardy to anywhere from minus 4°C to minus 8°C, I was unable to find much information about examples planted out in the UK, although knew of a few growing in sheltered gardens in Cornwall.

One hears anecdotal tales of this or that plant surviving such and such a temperature but there is rarely much accompanying information provided to give a fuller picture – has the plant withstood just a one-off freeze at this temperature, or was it repeated on a number of occasions throughout the winter, or perhaps survived an extended period of sub-zero temperatures? Did the plant receive any protection – either from surrounding vegetation, from walls or fences, or even artificially with horticultural fleece or a temporary covering structure? When it comes to pushing the hardiness limit of a plant, then a microclimate that can stave off one or two degrees of frost can make all the difference to its survival.

After weighing up the odds of survival (and perhaps having been lulled into a false sense of security by the string of relatively mild winters of the noughties!), I decided to place an order with the nursery for a 4 ft (1.2m) trunk which would be planted out.

Unlike imports of *Dicksonia antarctica* which are routinely sawn through at the base of the trunk as they are harvested (in the knowledge that new roots will form once re-planted), cyathea species will not tolerate such treatment and removal of the root mass will inevitably lead to the demise of the plant.

The trunk was delivered within a week of its arrival in the UK (having already spent two months in a shipping container travelling from Australia) and arrived, as is usually the case with imported tree ferns, with all fronds removed. Most importantly though, removal of the hessian sack at the base of the trunk revealed a modest amount of root – not as much as I had hoped for a plant of this size but maybe enough to get it re-established in its new home? Time would tell.

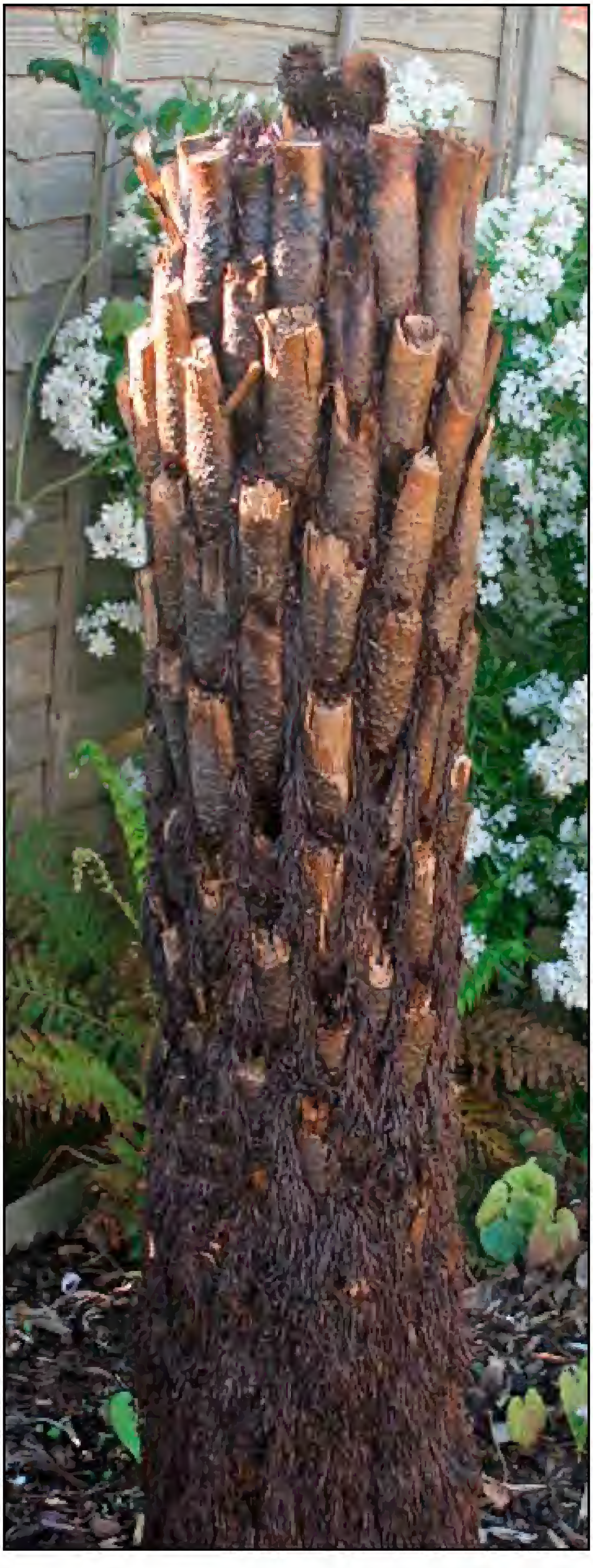

Fig. 1. (Right) The newly imported trunk of *Cyathea australis*

The trunk was duly planted to the same depth as it had been growing in its native environment (easily discernible by looking at the base of the trunk) and given a thorough soaking with a hosepipe. This was carried out regularly to ensure the trunk did not dry out. The site chosen was backed by a 6ft wooden fence with a large *Magnolia stellata* to the left and lightly overhung by the branches of a *Betula utilis* from the right.

Within just a few weeks the first new croziers emerged from the crown – totalling 7 in number. Not surprisingly, the stipes were considerably thinner and the fronds shorter than those the plant had been producing prior to being harvested. A further flush of fronds followed in the autumn. With the onset of winter, a series of frosts took their toll on the fronds with lows of minus 4°C causing them to blacken. At this point the withering fronds were folded back over the crown of the trunk and the top 18” (45cm) wrapped in a 10m x 1m roll of horticultural fleece, topped off with an inverted 50 litre plastic pot to prevent the crown from becoming too wet.

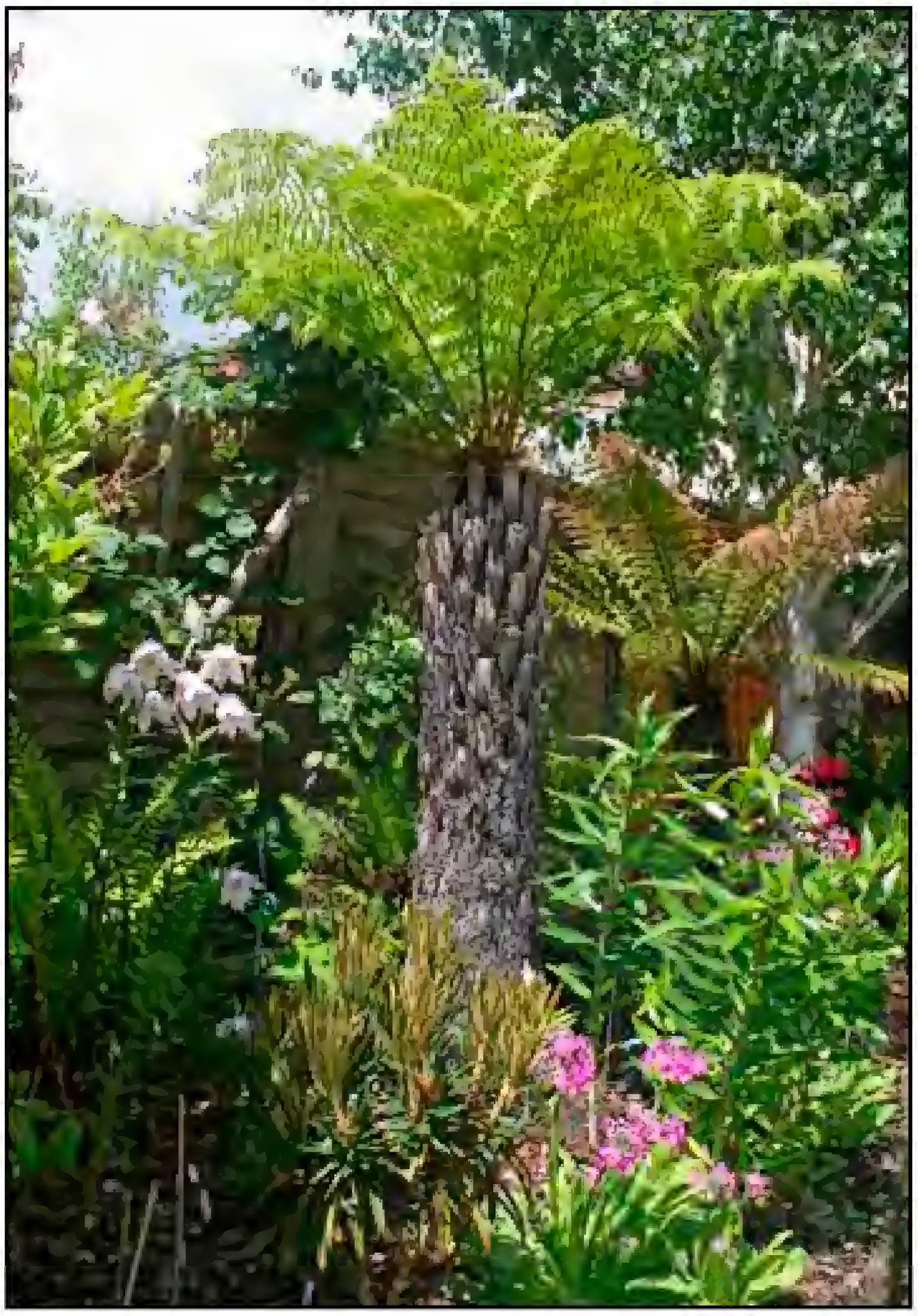

Fig. 2. *Cyathea australis* establishing in it's first season

As many readers living in the UK will remember, the winter of 2009-10 produced some of the worst weather experienced in a generation. Not only were the record-breaking low temperatures of note but also the prolonged duration of the cold with much of the country contending with sub-zero temperatures by day, as well as by night, for a period of several weeks. The lowest temperature recorded in my garden was minus 8°C – positively balmy compared to temperatures seen in some parts of the country but low enough to make me think it very unlikely the *Cyathea* would be throwing out any further fronds.

With the arrival of spring, the protection was removed from the crown and the dead fronds cut back. To my surprise, the crown still felt firm but no hint of any new croziers forming. By early April the Dicksonias planted nearby sprang back into life but the *Cyathea australis* remained resolutely dormant. Then, in mid-May, a flush of eight fronds! Despite their late arrival, each was a little stronger than the fronds produced the previous year. So, not only had the plant survived but, hopefully, this was a sign that it was re-establishing itself in its new home, rather than just producing fronds using reserves stored in the trunk.

The following winter (2010-11) was also harsh, although perhaps not as severe as the year of “The Big Freeze” as it had come to be known in the media. The subsequent two winters were fairly average, with lows of around minus 5°C – just enough to defoliate the plant – but the winter of 2013-14 was exceptionally mild. With only two or three light frosts throughout the winter, no fleece protection was required and the *Cyathea australis* remained fully fronded for the first time and even started flushing in early March. With this head-start on the growing season, the plant went on to produce the largest fronds it had since arriving, averaging around 2 metres in length, and providing a nice contrast to the Dicksonias.

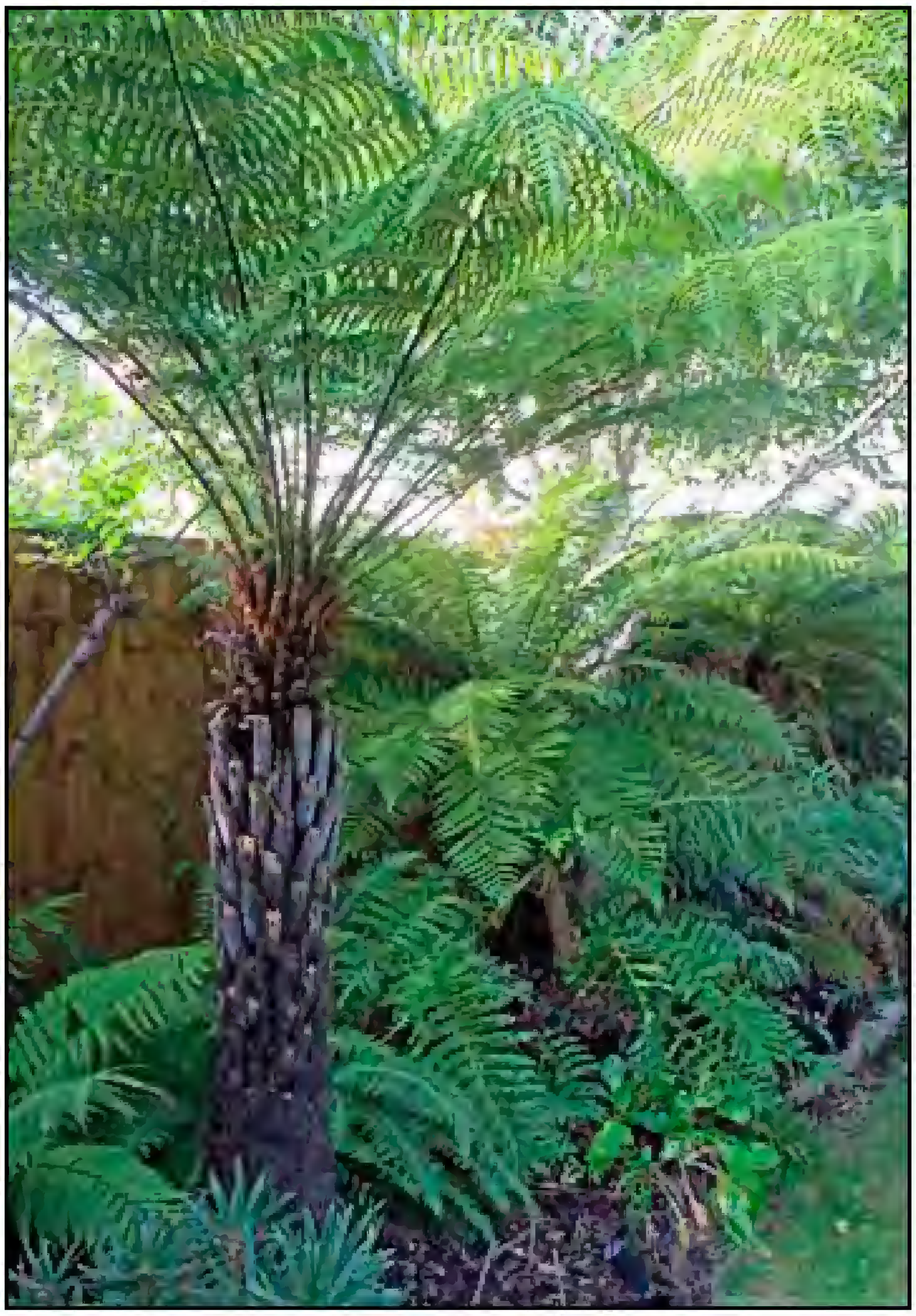

Fig. 3. My *Cyathea australis* established and thriving

While it is unlikely to ever perform as well in London as it does in its natural environment, the *Cyathea australis* has come through some of the worst weather it will hopefully ever encounter – I just hope I do not have to come back with a report on its extreme heat tolerance, or otherwise, should we ever have a real scorcher of a summer! ❐

A *Cibotium barometz* bargain

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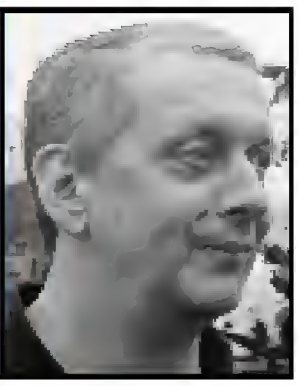

With the growth of the internet, the world sometimes seems like it is getting smaller. One of the benefits of this, for those interested in growing exotic ferns, is access to overseas growers and nurseries that previously would not have been possible. Many of these are willing to send plants to E.U. countries at reasonable cost and are able to supply the necessary phytosanitary certificate for importation. Another potential source is Ebay, although one should check as not all suppliers can offer the paperwork.

It was from this source that, in 2009, I came across a small orchid nursery based in Thailand, which was offering young plants of *Cibotium barometz*. For the very reasonable sum of around £8 (yes, including phyto certificate and delivery!), I decided there was little to lose for the chance of growing this majestic fern and proceeded to place an order.

A small box arrived about 10 days later with what appeared to be a “pup” taken from a larger plant. The fronds had been trimmed off for mailing but there were two small croziers just poking through the orange hairs at the crown. At the other end of this little 1 inch trunk, there were very few roots so the plant was potted up and placed in a heated propagator.

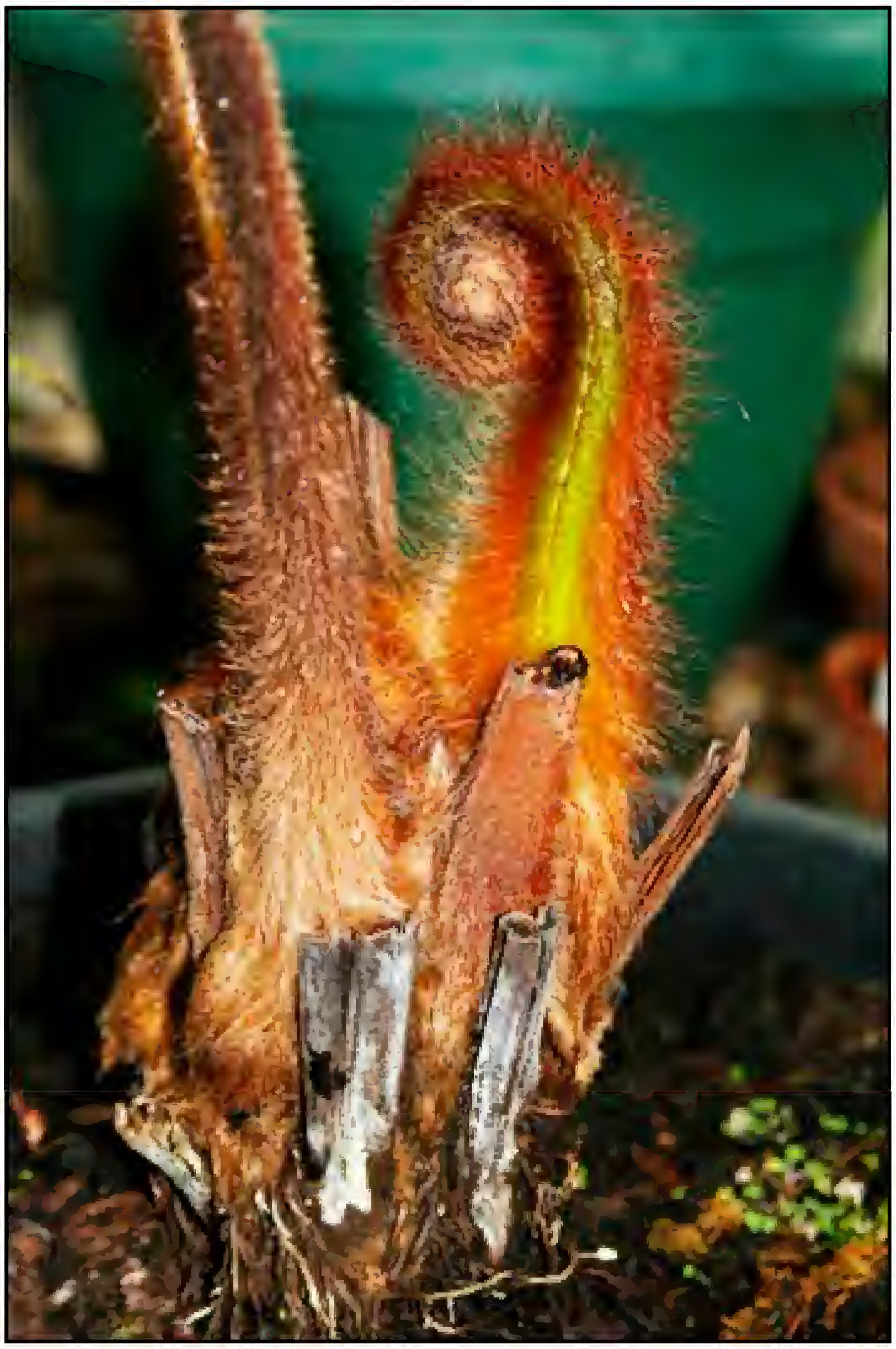

Fig. 1. The first frond of the newly arrived *Cibotium barometz*

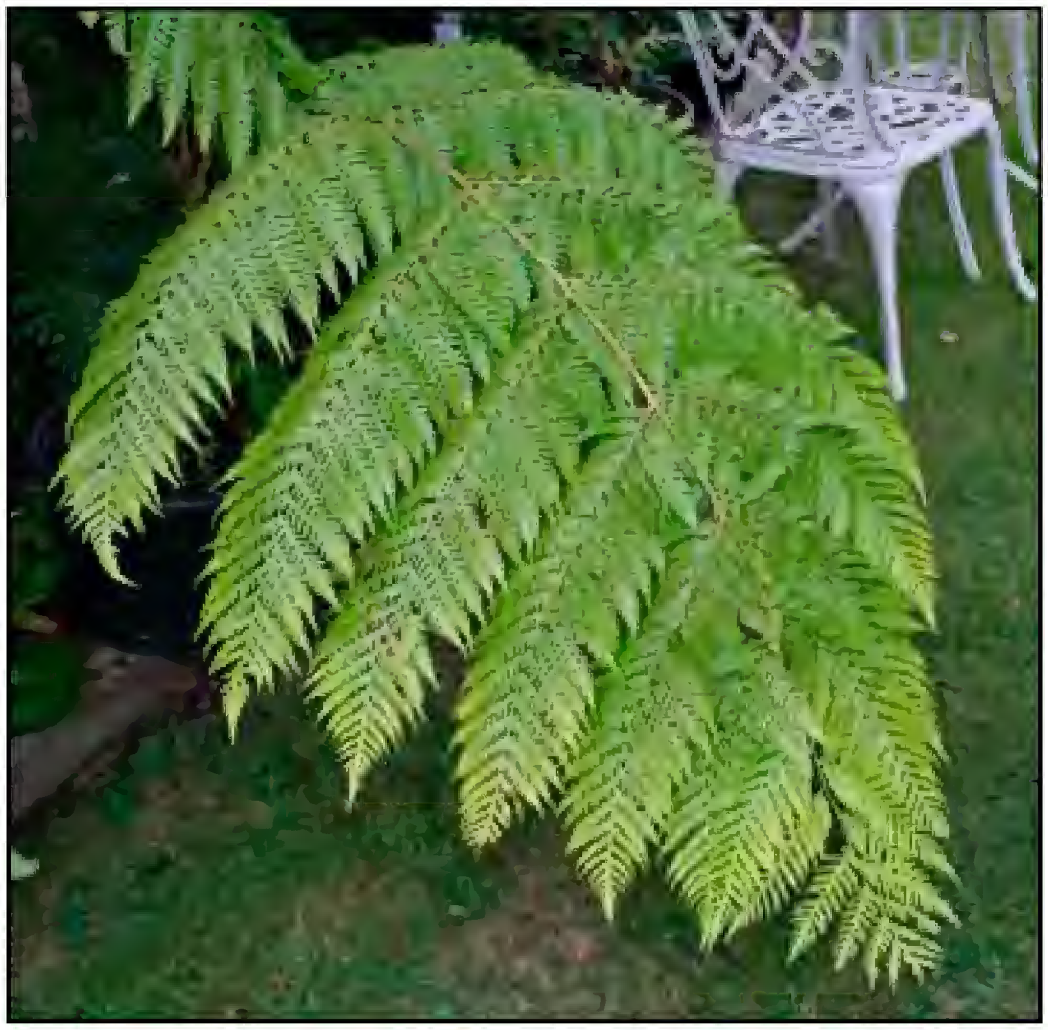

Fig. 2. Impressive new fronds

To cut a long story short, the plant has never looked back and now resides in a 15 litre pot with the most recent fronds exceeding 2 metres in length. I have imported a number of other ferns since that time but none can match the bargain barometz! ❐

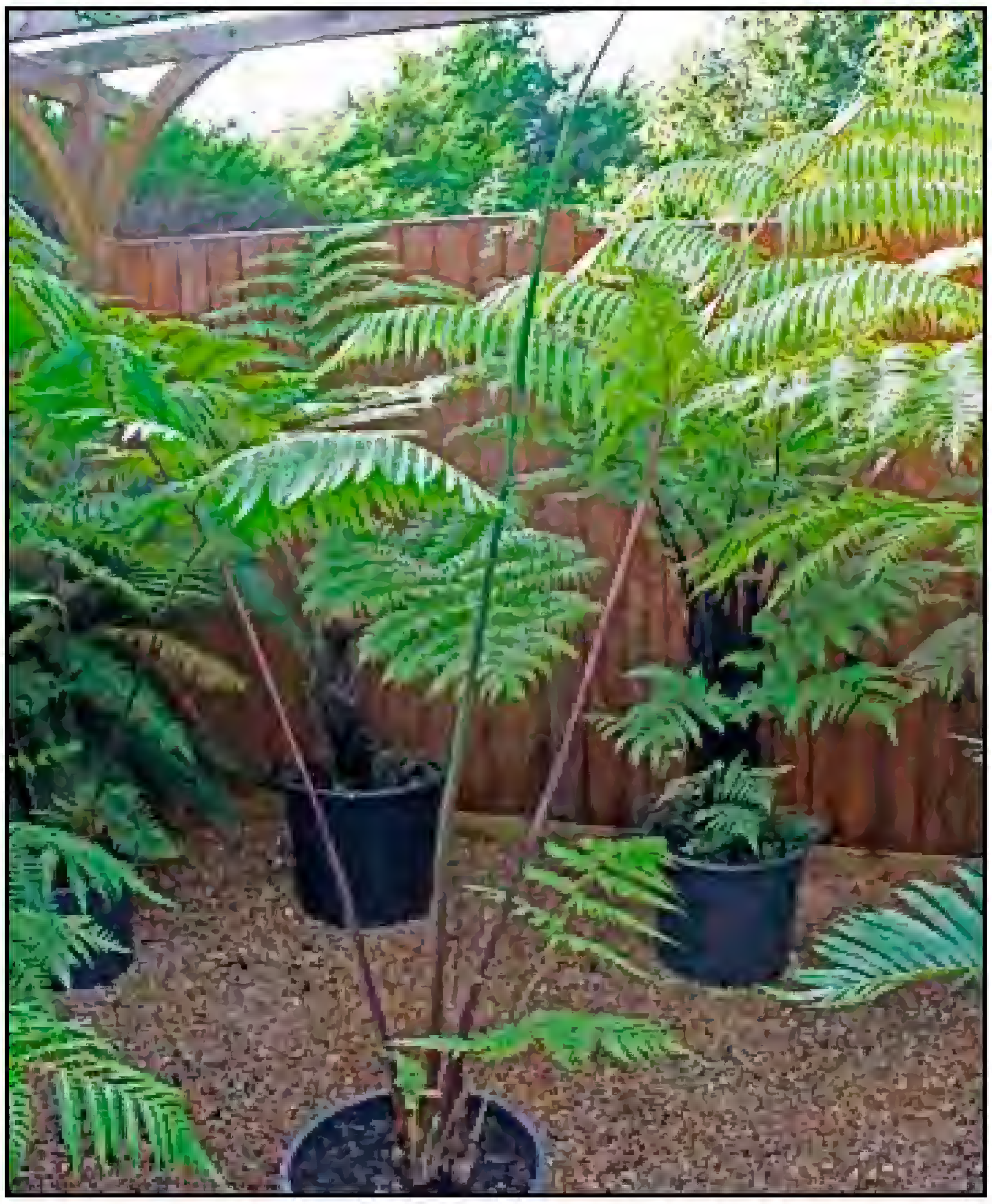

Fig. 3. The newest fronds are over 2 metres in length

Strange reaction of *Polypodium fauriei* to pressing

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One target species for me to see on the recent BPS trip to Japan was *Polypodium fauriei*. It is quite widely distributed in Japan but apparently not particularly common anywhere. Prior to departure I visited the herbaria at Kew and the Natural History Museum. Both had several sheets of *P. fauriei*. Every sheet showed the petiole and rachis curling up on itself. In Figs. 1 and 2 I show typical sheets. Imagine a colony in the garden with all fronds curled. It might only be a curiosity but it just might look quite attractive.

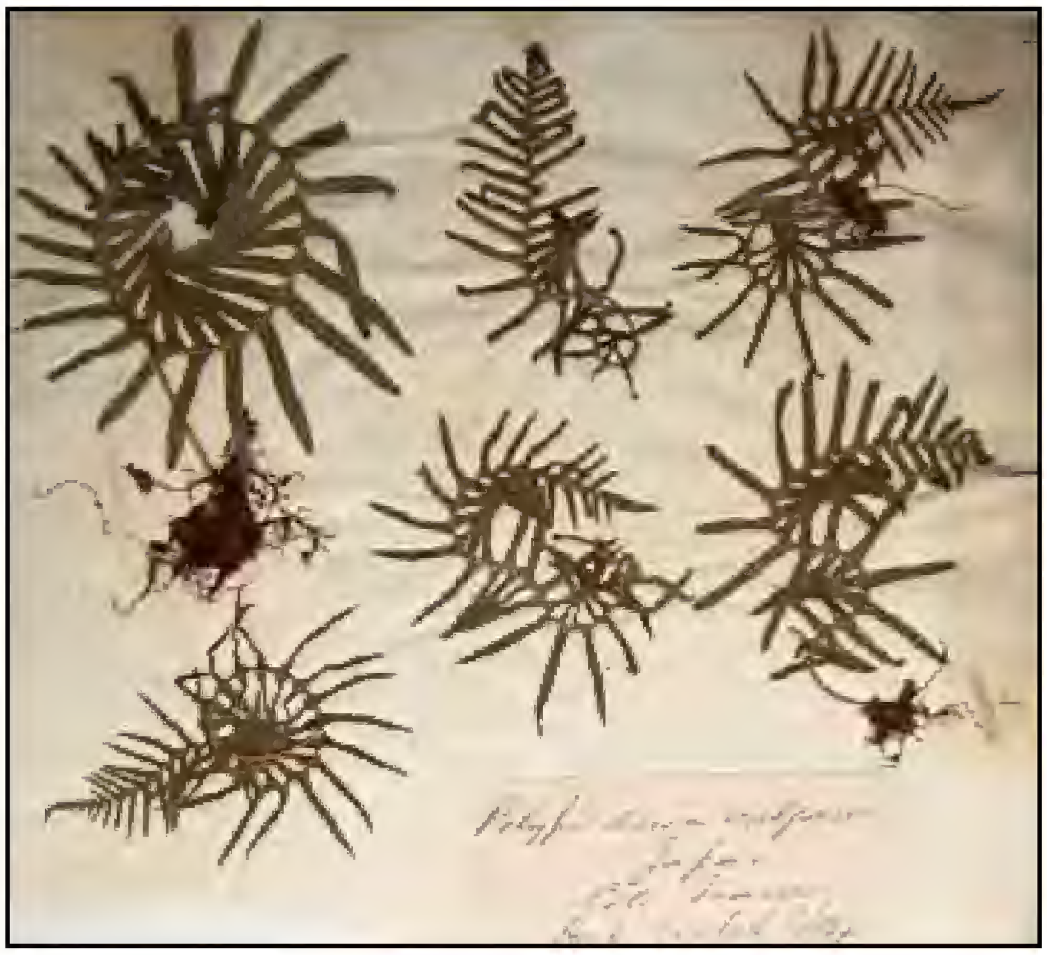

Fig. 1 *Polypodium fauriei* collected by Maries in 1884 (**Reproduced with kind permission of the Board of Trustees of the Royal Botanic Gardens, Kew)**

It was quite a few days before we encountered the fern in the wild. It is a very beautiful fern (although I probably have rose tinted spectacles when it comes to a polypodium!), but the rachis and petiole was disappointingly dead straight. See Fig. 3.

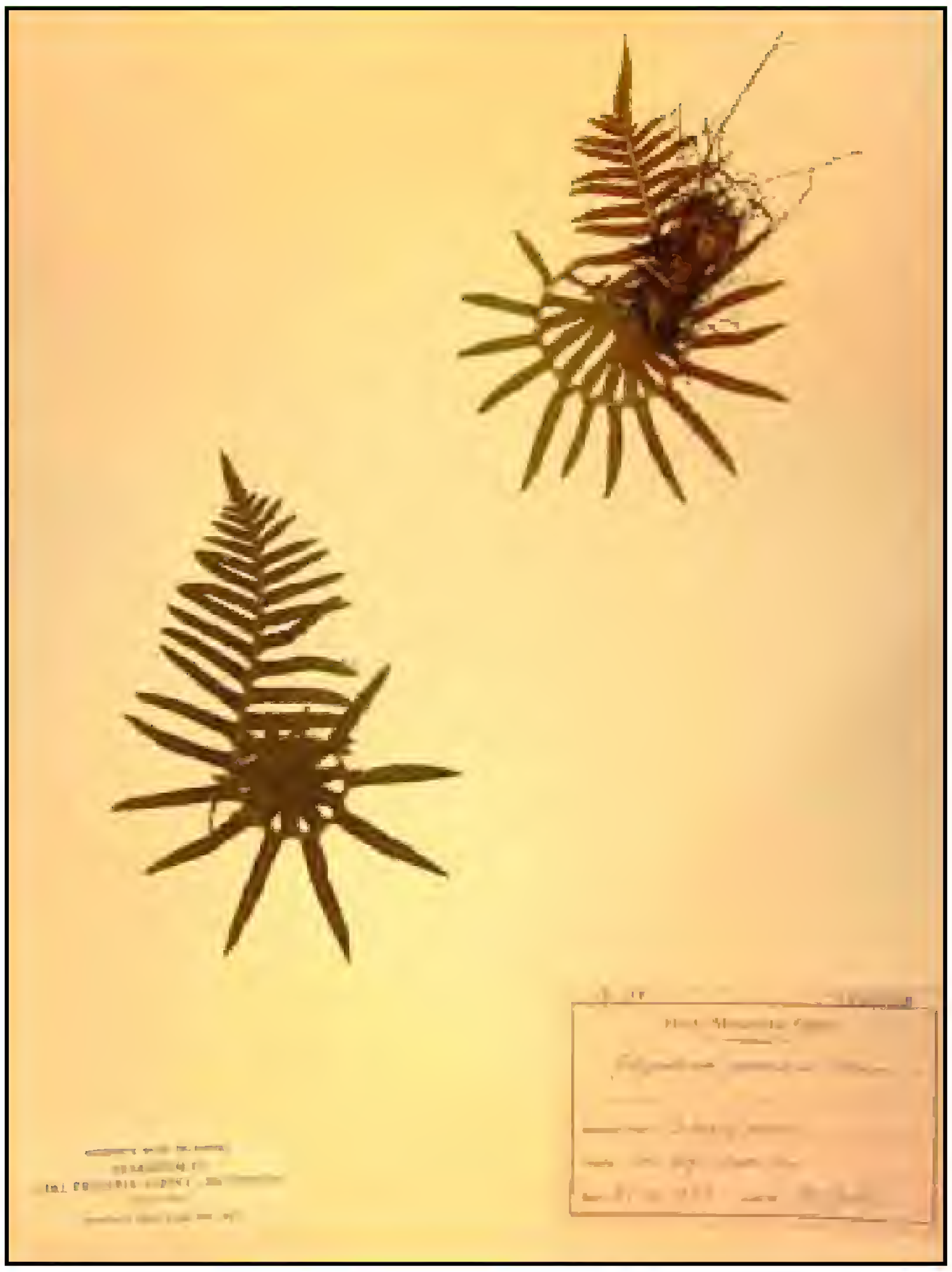

Fig. 2 *Polypodium fauriei*, collected by Ogata in 1927 (Herbarium of the Natural History Museum)

Other species of *Polypodium* in Japan, *P. vulgare* (Japanese version) and *P.sibiricum* are very rare. The *P. vulgare* is not the same as our European plant. It would be interesting to know why the stipes and petioles curl of this one species on herbarium sheets. I have not seen any similar curling on any other sheets. ❒

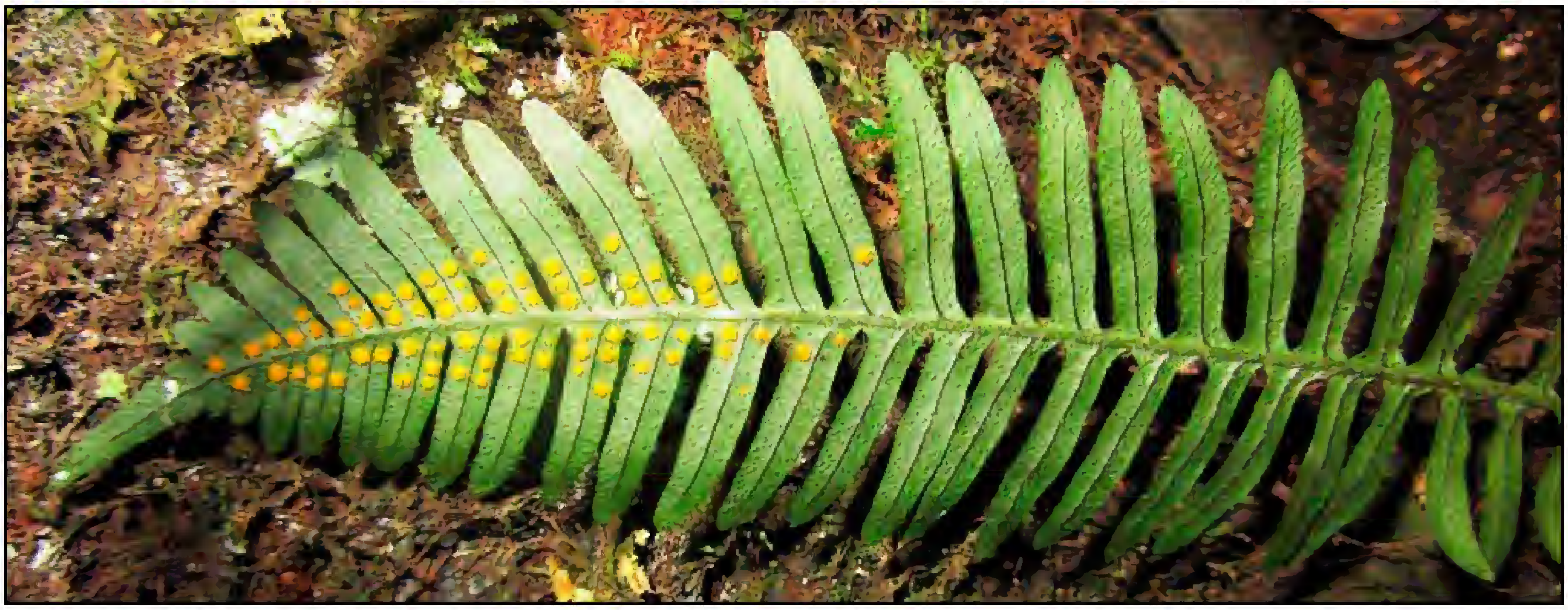

Fig. 3 Freshly cut frond of *P.fauriei*. Kawakari-mura, Nara, Japan. 2014.

Hardy Fern Foundation Turns 25

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It all began in 1989 with a group of over caffeinated fern enthusiasts gathered in my Bellevue, WA living room. So what did we want to do? That was the easy part. Our goal was to provide a means to share information and inspiration to fellow fern growers and encourage would-be fern growers.

And how would we do this? This was where it became a bit more complex! However, in the spirit of optimism and "noble" purpose we decided that it called for an organization with long term goals dedicated to "establishing a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community". To achieve this purpose, many species, hybrids and varieties, both common and rare, were to be propagated and tested in selected environments for their different degrees of hardiness and ornamental value.

We would call it The Hardy Fern Foundation.

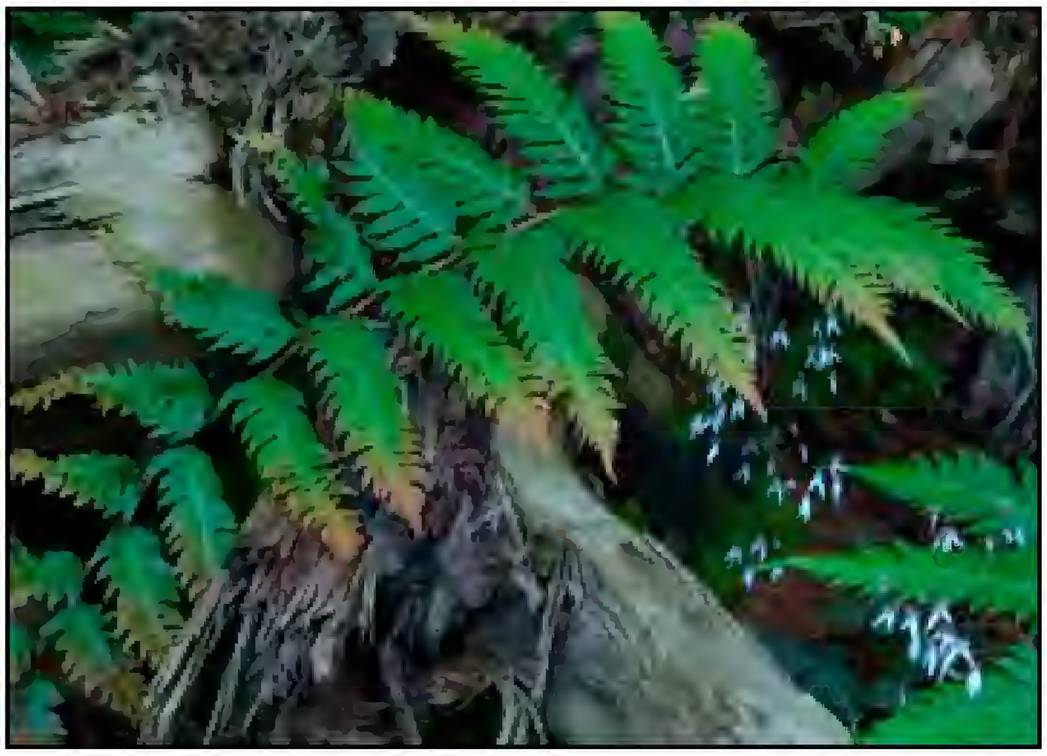


Fig. 1. *Woodwardia unigemmata* in the stumpery

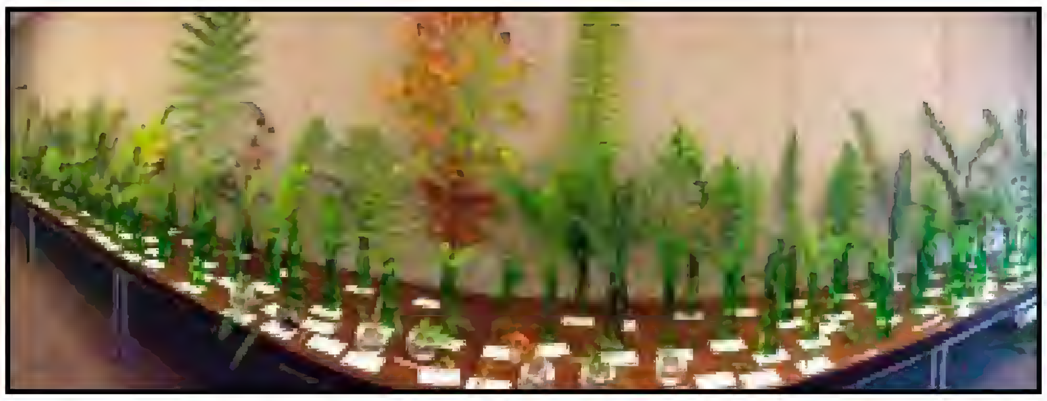


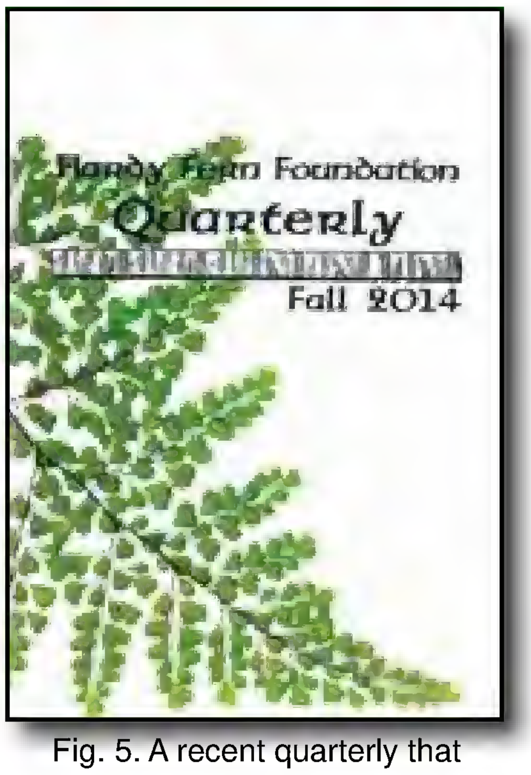
Fig. 2. Frond display H.F.F. Fall Social 2013

Looking back I marvel at how much energy and effort by our dedicated group went into establishing the organization and accomplishing our goals. We had help of course, including encouragement from our friends and fellow enthusiasts across the country as well as the Northwest Horticultural Society, the American Fern Society and advice from Dr. John Mickel of the New York Botanical Garden. He and the late Joe Beitel would become our first scientific advisors.

Hardy Fern Foundation
NEWSLETTER

President's Message

Fig. 4. The first newsletter. Early days in black and white.



Hardy Fern Foundation
Quarterly
Fall 2014

Fig. 5. A recent quarterly that replaced the newsletter. Lots of colour showing how much we have progressed.

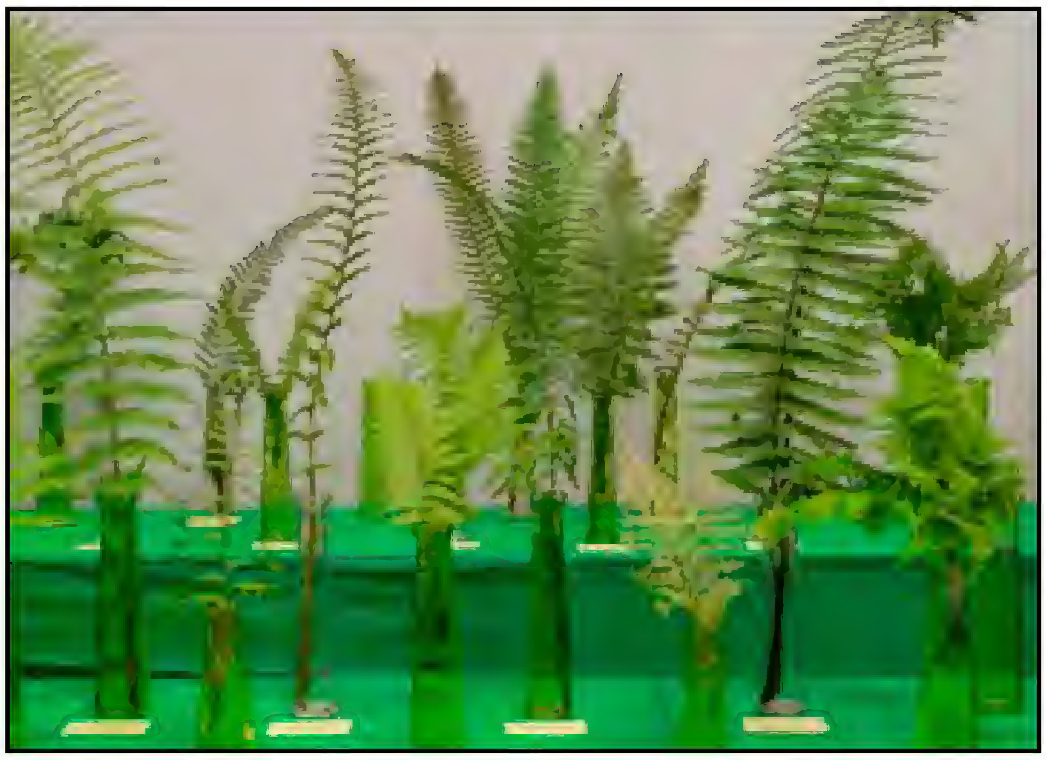


Fig. 6. A close up of the fronds at the display in 2014

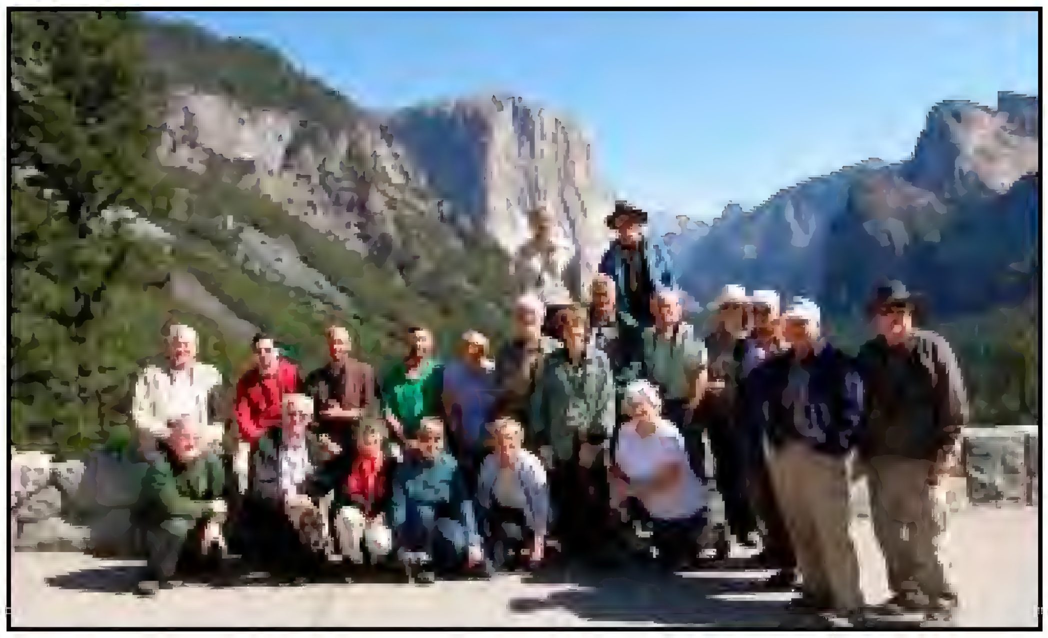


Fig. 7. A joint meeting with the B.P.S. in California, 2009

Bottom L-R: Martin Rickard, Naud Burnett,Wim Burnett, Kathryn Crosby, Sue Olsen, Pat Riehl

Middle L-R: Alan Ogden, John Acock, Richie Steffen, Brian Smith, Gill Smith, Graham Ackers, Jane Whiteley, Paul Ripley, Kent Kratz, Paige Woodward, Pat Kennar, Rose Marie Schieber, Jack Schieber, John Scott

Back: Pat Acock, Dan Yansura

Although it was understood that for practical purposes our primary garden(s) would be in the greater Seattle area it was clear that we also wanted and needed national test sites and display gardens representing a variety of climatic conditions. We were very pleased to find immediate interest from a number of excellent botanical institutions from across the country (Fig.11).

Membership drives and solicitations, descriptive brochures, lots of paper work (including legal obligations), obtaining plants, planting plants, researching potential test sites, and yes, especially pursuing funding followed intensely. We were on our way.

One of our first projects was to launch a newsletter (now a Quarterly) (Figs.4 & 5) to keep members up to date with activities as well as to present information on cultivation, fern travels and a great variety of articles of general interest. Almost from the beginning we have featured an in-depth article on a specific fern and this editor is grateful to member Jim Horrocks of Salt Lake City, Utah for faithfully doing the research and writing a comprehensive presentation.

Growth and progress continued and happily things went very well. By the end of our first year I was able to report the following notes of progress in our Newsletter:-

> “We are pleased to report that in January of this year the Northwest Horticultural Society gave us a grant in the amount of $5000 as seed money to make our proposals a reality.
>
> Our membership is approaching 250 and is truly national in distribution (33 states plus Canada).
>
> In cooperation with the Rhododendron Species Foundation the Hardy Fern Foundation planting became a reality this past spring with a ground breaking in June. 189 generously donated ferns representing 56 species and varieties were arranged in the Lower Study Garden and pond area. A second work party in October added another 115 ferns.
>
> Our first spore list will be published in conjunction with the American Fern Society.
>
> Requests to be considered for satellite garden status have been received from seven institutions representing a considerable divergence in climatic conditions. In addition offers of cooperation have been received from as far away as Holland, Great Britain and the former East Germany.”

(Several years thereafter, we began our annual fern distribution programme whereby we sent ferns to affiliated gardens for evaluation and we offered ferns for sale to members.)

From this modest beginning growth and enthusiasm as well as generosity grew. We were really on our way!

As the years progressed our activities expanded. The Northwest Horticultural Society has sponsored a Fern Fest annually since 1973 (when to display the material we carried tables down from and, mind you, back up to the storage attic of Seattle’s Washington Park Arboretum). It has of course long since expanded and moved to the more accommodating Center for Urban Horticulture on the University of Washington campus. We joined them in a mutually-delightful cooperative effort for several years and with their approval took over the sponsorship in the early 2000’s. This fest consists of a major (reputed to be the most comprehensive in the US) sale of ferns and companion plants, as well as a featured speaker (including Britain’s Martin Rickard in addition to well respected US experts Herb Wagner, Robbin Moran and Carl Taylor among others). The fest is now enjoyed annually on the first weekend in June(Fig.10).

For other activities we put on an annual display at the Northwest Flower and Garden Show (Fig.8) that attracts

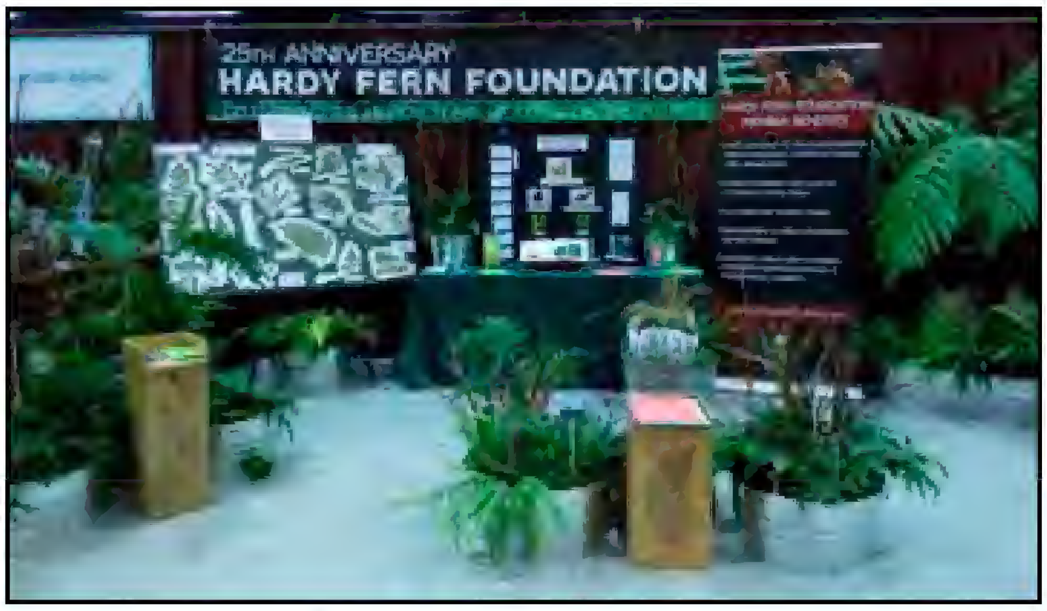


Fig. 8. Part of display at the Northwest Flower and Garden Show 2014

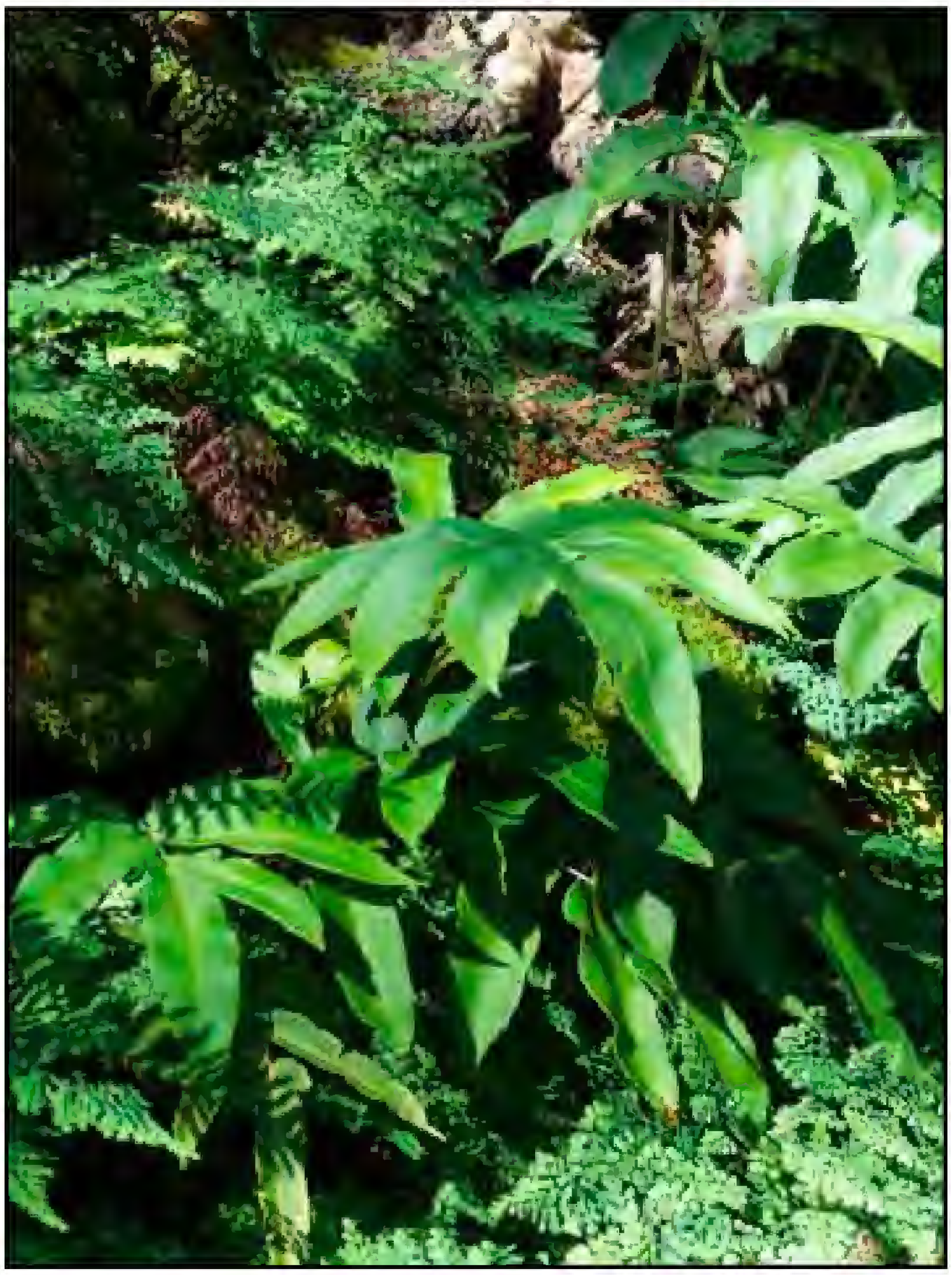


Fig. 9. *Dryopteris sieboldii* in the stumpery

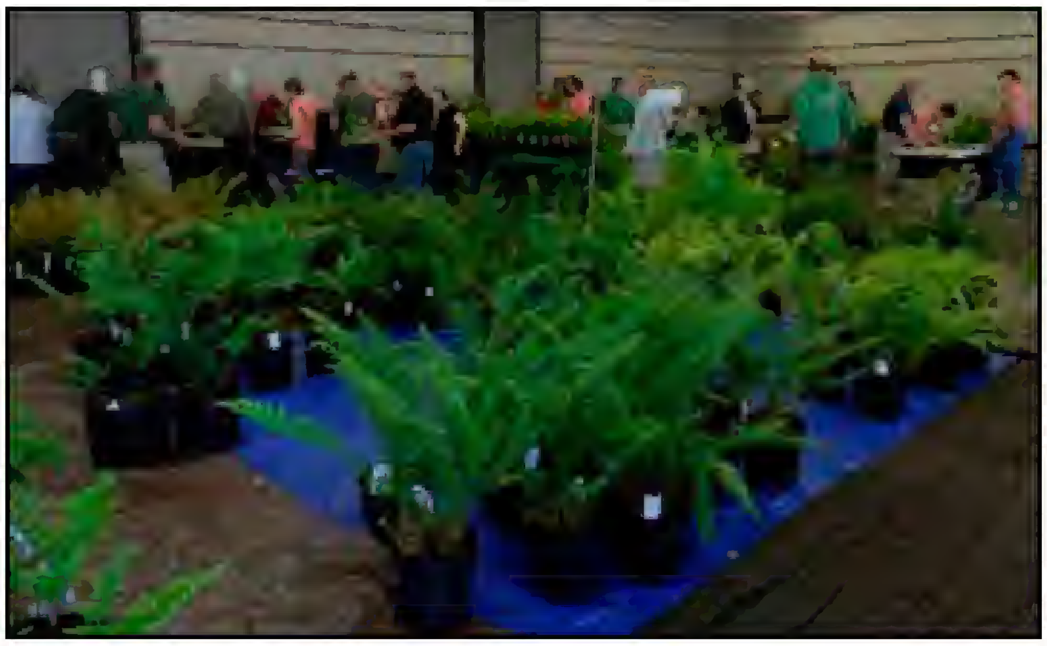


Fig. 10. Fern Fest plant sale

thousands of visitors to Seattle's Convention Center in February. This began as a very modest display booth but this year will be an expansive joint project with the Northwest Horticultural Society.

Classes and tour opportunities have increased over the years and are very popular. The varied classes have featured everything "ferny" from growing ferns from spores to creating and planting a fern table. Of the garden tours in addition to local attractions a number of exciting excursions have been jointly sponsored by the HFF and BPS. These include the Pacific Northwest, the East Coast, Texas, Germany, the Southeast and California (Fig.7).

We complete our year with an annual fall social, a fun and educational gathering with an extensive informational frond display artistically arranged by Richie Steffen plus a lecture, which usually involves tempting us with travel, and completed by a most enjoyable potluck lunch (Figs.2 & 6).

While initially it was our intent to install our primary test garden at Lakewold in Tacoma, it was later decided that the Rhododendron Species Botanical Garden in Federal Way, WA offered better opportunities for mutually complementary displays of both the rhododendrons and ferns. Our collection there expands annually but our singular most popular attraction is the stumpery, which was created in 2009 (Figs. 1,9,12,13 & 14). Composed of stumps and/or "root wads" that comfortably house displays of our friends the ferns, ours was created by landscape designer and current HFF President John van den Meerendonk. It covers over half an acre and consists of some 140 "stumps" as well as a long horizontal bench created out of a fallen tree. The ferns and companion plants have filled in handsomely so it is a lovely year - round display and it is the largest public stumpery in the world.

And so here we are now. We're twenty five years old. We celebrated at our annual social in the fall of 2014 and while we no longer regularly meet for coffee in my living room the board gathers annually for wine, camaraderie and good cheer at a holiday party and yes, here in my living room. ❐

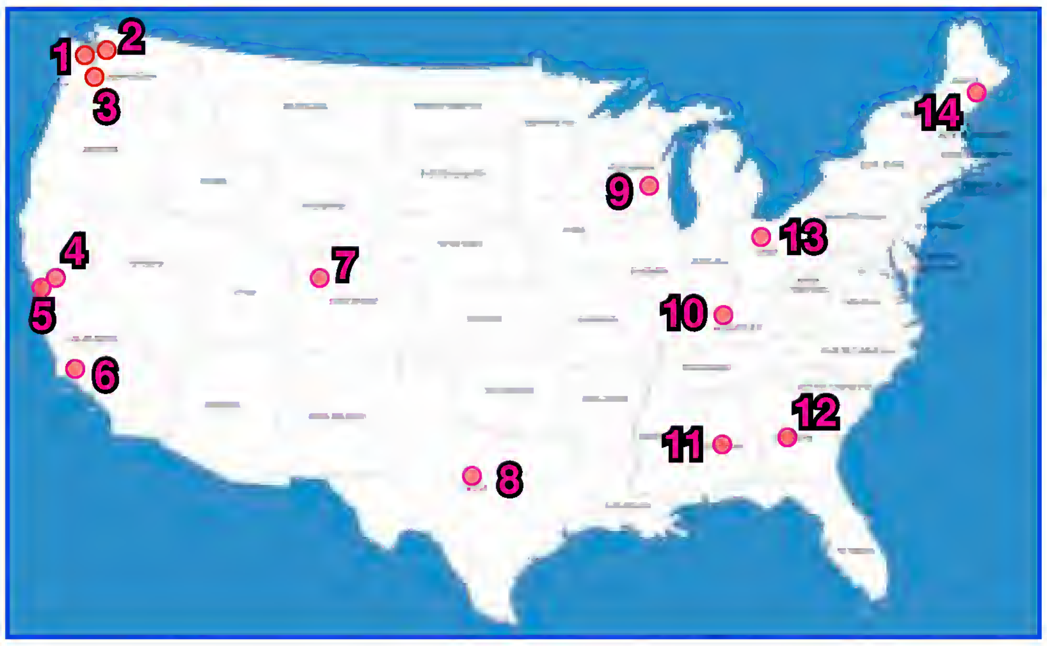


Fig. 11. The map shows our affiliated gardens:-

1. Bainbridge Island Library, Bainbridge Island, Washington
2. Bellevue Botanical Garden, Bellevue, Washington
3. Lakewold Gardens, Tacoma, Washington
4. University of California Berkeley Botanical Garden, Berkeley, California
5. Strybing Arboretum, San Francisco, California
6. Lotusland, Santa Barbara, California
7. Denver Botanic Gardens, Denver, Colorado
8. Dallas Arboretum, Dallas, Texas
9. Rotary Gardens, Janesville, Wisconsin
10. Whitehall Historic Home and Garden, Louisville, Kentucky
11. Birmingham Botanical Gardens, Birmingham, Alabama
12. Georgia Perimeter College Garden, Decatur, Georgia
13. Inniswood Metro Gardens, Columbus, Ohio
14. Coastal Maine Botanical Garden, Boothbay, Maine

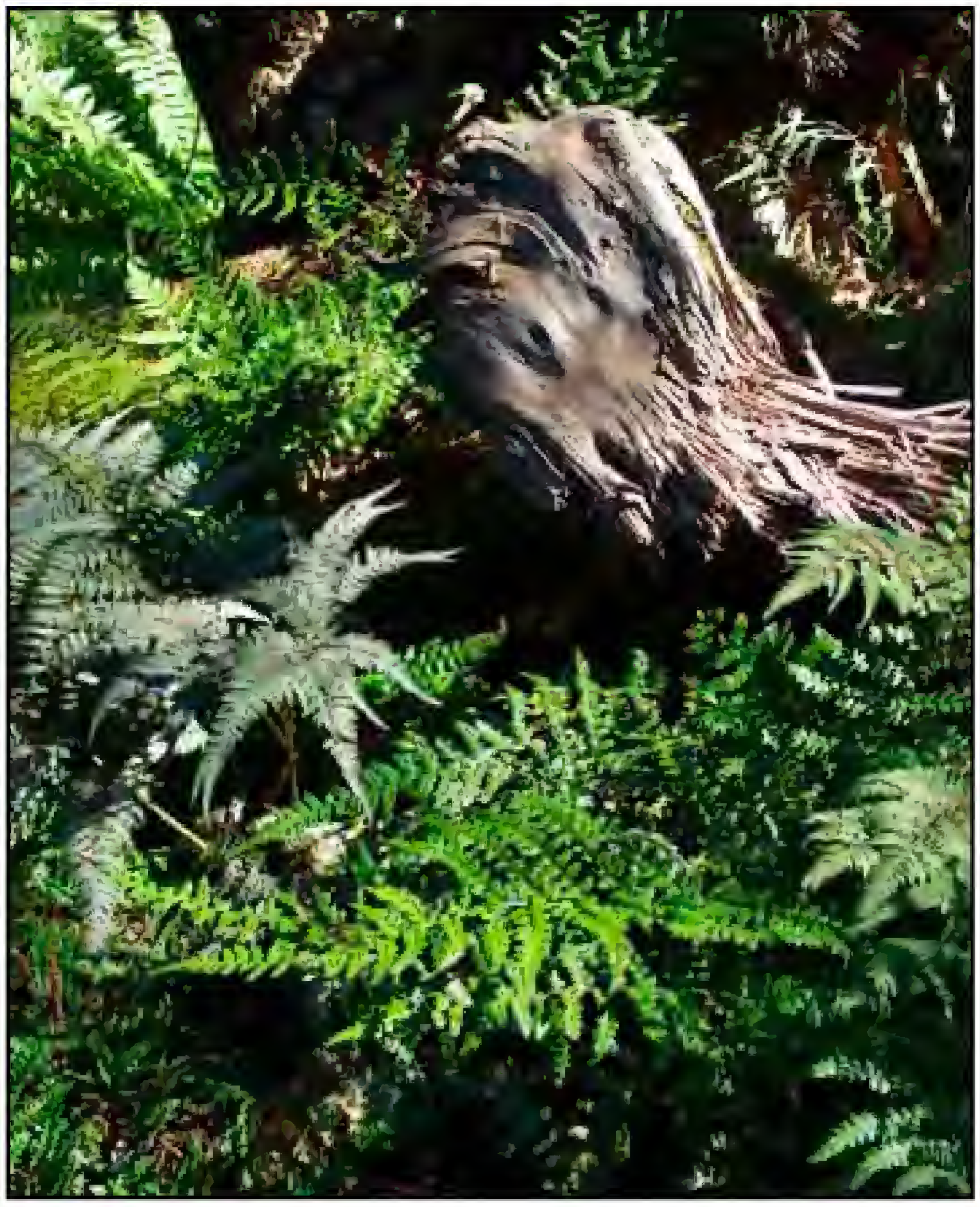


Fig. 12. Fern collection in the stumpery

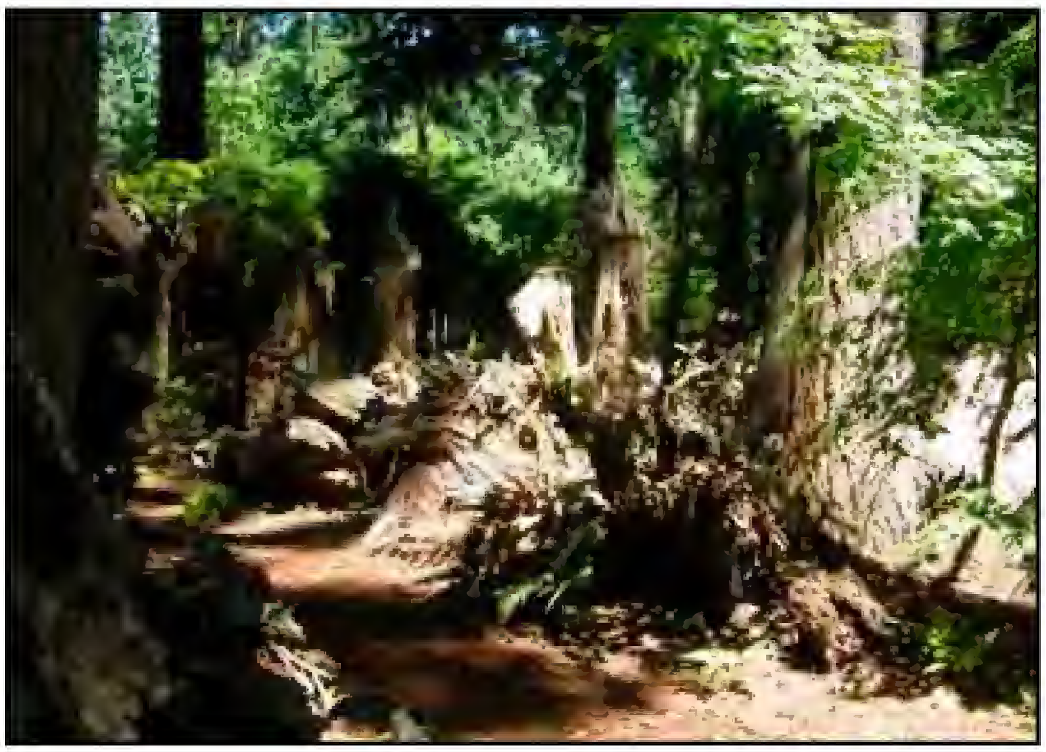


Fig. 13. Approach to the stumpery

Fig. 14. Cake creation for the ceremony dedicating the H.F.F. stumpery. It was almost too pretty to cut!

More things that eat our ferns...

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A couple of years ago I was shown a photograph of fern fronds in a friend's garden that had been eaten down to the midribs (Fig.1). I had no idea what had caused this except that it looked like the type of damage caused by butterfly or moth caterpillars. The next year I observed very similar pattern of damage on a single isolated fern frond in my own garden, but again there was no sign of what had caused it. Later the same year there it was again, this time on *Todea barbara* in a pot near my back door. And this time I caught the culprit red-handed (or green-mouthed, perhaps). A bright green caterpillar with paler dashes along the top, about two centimetres long (Fig.2).

I put it in a jar with some fern fronds to chew on, and immediately forgot about it. Some time later I investigated the jar thinking I'd probably killed it out of neglect, and found a fully formed and rather beautiful moth (Fig.3). This, as I now know, is Angle Shades, *Phlogophora meticulosa*. It is a common moth, widely distributed in the UK although somewhat less so in the north. The UK resident population is supplemented by migrants from the continent each year. Once seen it is entirely distinctive, but it can be very difficult to spot as it is exceptionally well-adapted for hiding among dead leaves and bark. The caterpillars feed on a wide range of wild and cultivated plants (including unopened flower buds), so I suppose that in a garden full of ferns it's not surprising it would choose those to eat.

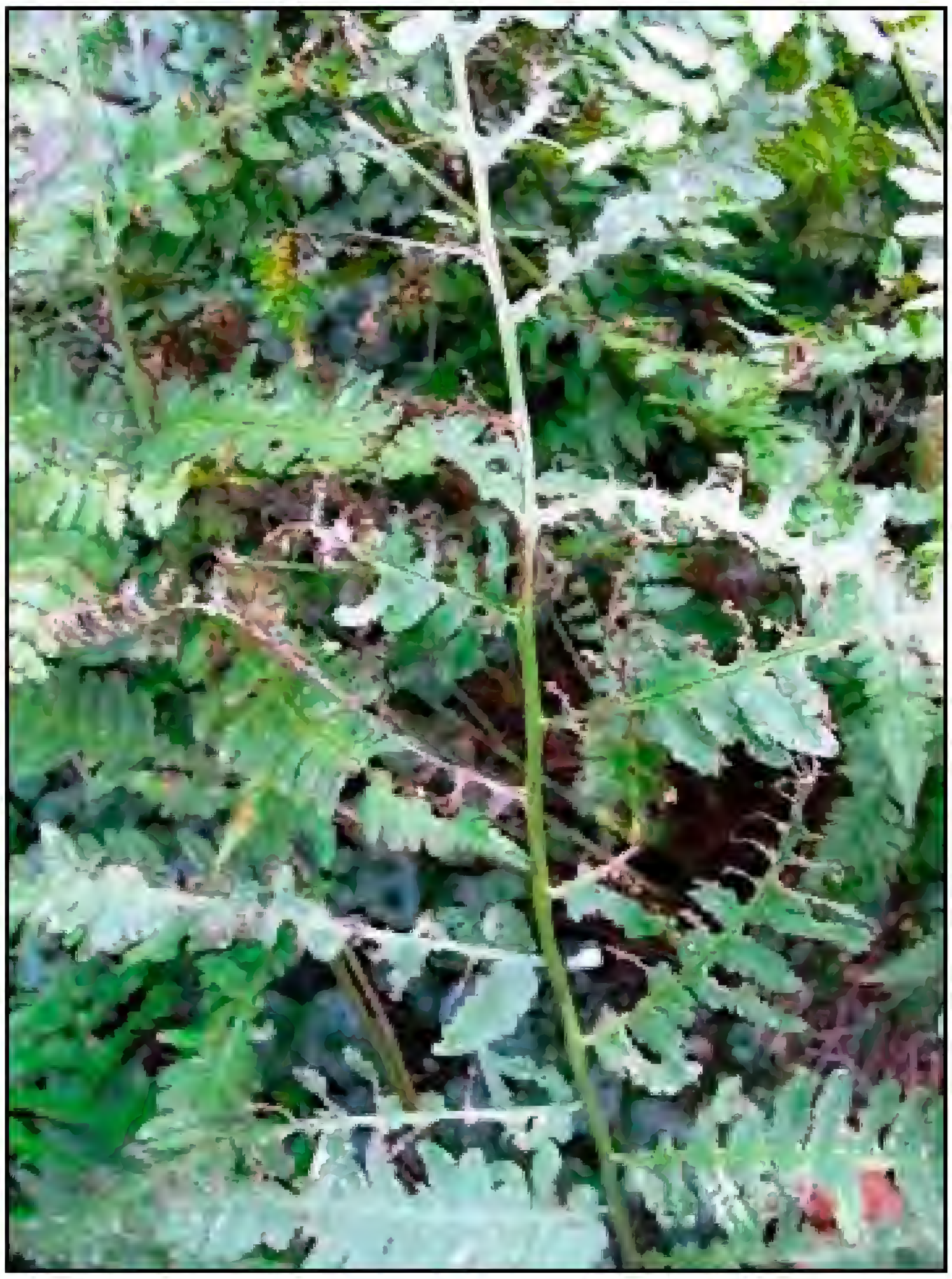

Fig. 1. *Dryopteris goldiana* eaten down to the midribs
photo: Howard Matthews

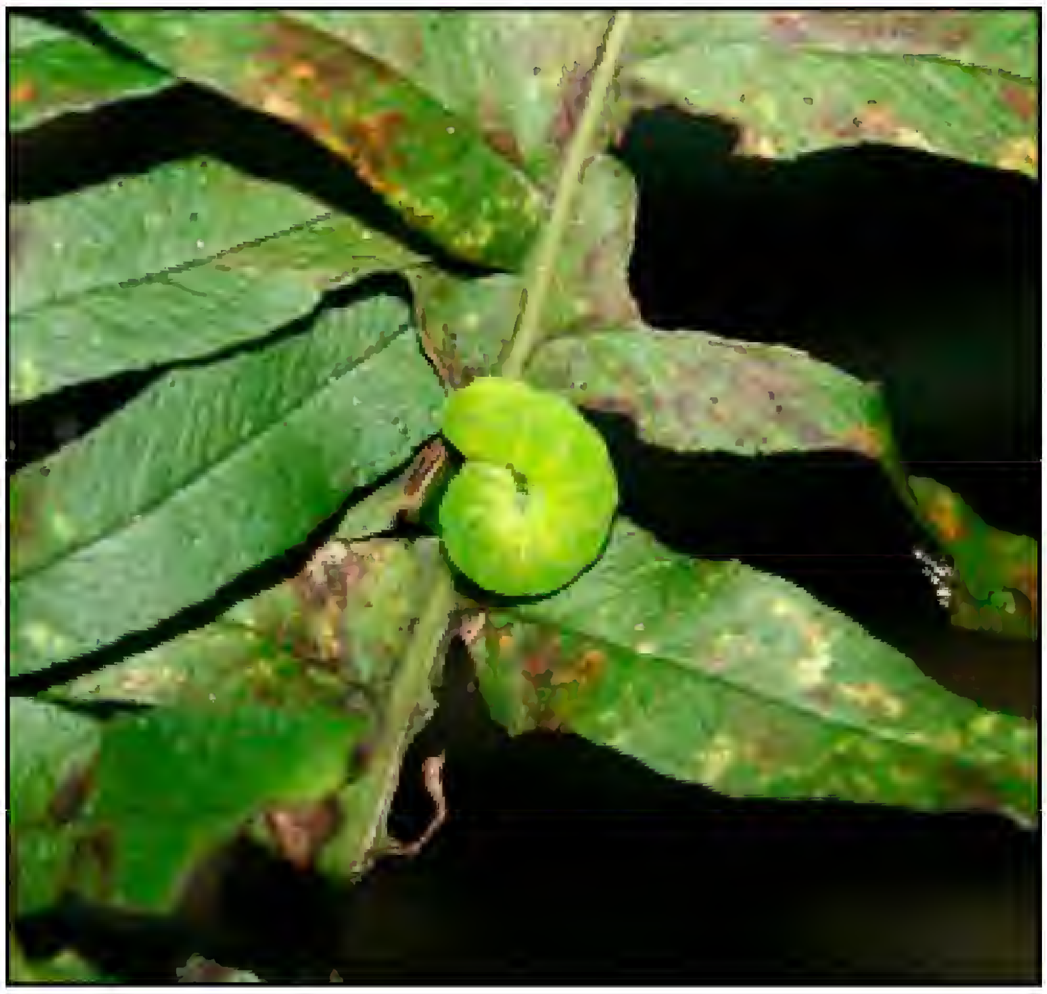

Fig. 2. The culprit. The caterpillar of *Phlogophora meticulosa* (Angle Shades)

The caterpillars can be either bright green or brown, with pale stripes on each segment and a broader pale line along the lower side (not so visible from above), and are up to 45mm long. The moth has two broods in a year, the first in late May to June, and the second from August through October. The the autumn caterpillars overwinter in the ground or in leaf litter, but may emerge to feed in milder weather.

There is a somewhat similar, related species called the Small Angle Shades, *Euplexia lucipara*, which also apparently includes Bracken and other ferns in its diet.

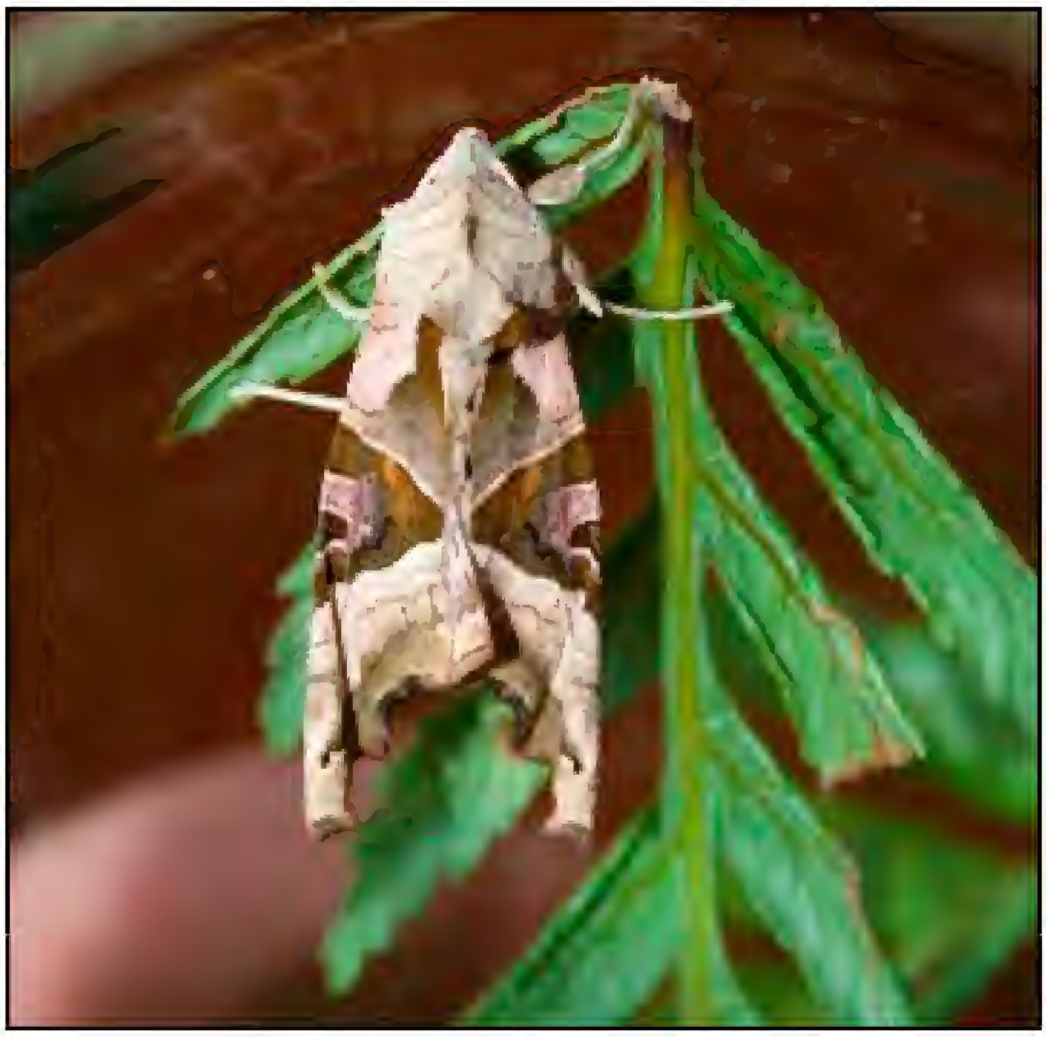

Fig. 3. Adult *Phlogophora meticulosa* (Angle Shades), handsome but deadly to ferns

Back from the dead!

The saga of *Polystichum setiferum* 'Foliosum Edwards'

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Polystichum setiferum 'Foliosum Edwards' has long been an enigma. Little is known about it and we have only one illustration of an immature frond currently kept in the BPS Herbarium at Wisley. First news of `Edwards' appeared in the report of the 1914 BPS annual meeting (*British Fern Gazette*. Vol. 2 No. 21 September 1914, p.214) see Fig. 1 below: Note there have been major changes to fern varietal naming since 1914, for *P. aculeatum* here read *P. setiferum*, also angulare = setiferum and for *pulcherrimum* read 'Plumosum Bevis'.

> The " sensation " of the meeting, however, was the exhibition by Mr. J. Edwards of a series of fronds of plants raised by him from *P. aculeatum pulcherrimum,* the parent of the now renowned strains of *P . ac. pulch. gracillimum Druery* and *P . ac. p. plumosum Green.* The fronds shown differed widely from both of these types, being very foliose, and the remarkable feature of the exhibits consisted in the facts stated by Mr. Edwards that only this form appeared in his batch of youngsters, raised be it remembered, from a division of the same plant, *P . acul. pulcherrimum,* which yields the other two strains in question, so that the three strains had practically one and the same identical parent. Mr. Druery and Mr. Green, the joint raisers of the two first sections, had identical results, viz. about 30 per cent, of gracillimum and one plumosum, the rest, with very few exceptions, being true pulcherrimums, and the few exceptions reversions more or less to the normal, but on angulare lines rather than aculeatum. Why, therefore, the spores on Mr. Edwards' division (pinnae of which he exhibited to show that the spores were borne on isolated sporangia in precisely the same way as with the previous sowings) should produce a quite different batch, containing none of the other types, forms an insoluble enigma for the teratologist. Mr. Edwards reports that the first batch raised consisted of six plants only—three of the new foliose type, the other three normal, but more like angulare than aculeatum. This agrees with the reversions noticed in both Mr. Green's and the Editor's crops. The parental (pulcherrimum) type did not appear at all. The second sowing yielded about 30 plants, of which eight or nine are what we may term Edwards' "foliosums", no parental forms, and the rest reversions on the same lines as described. The third sowing has yet to show its results. The net result so far is very remarkably different from the original one, since while neither pulcherrimum itself nor a single plant of the gracillimum section appeared, those which did declare a difference were of another type altogether, though equally beautiful, while the percentage of reversions was much greater.

Fig. 1. Extract from *British Fern Gazette* Vol. 2 No. 21

Therefore 'Foliosum Edwards' was a completely new break as a sporeling from 'Plumosum Bevis'. Other incredible new breaks from 'Plumosum Bevis' were known at the time but they all had some obvious affinities with the parent. Any connection between 'Plumosum Edwards' and 'Plumosum Bevis' was not so easy to see. Figs.2 and 3 show two pictures of original clone `Plumosum Bevis' for comparison with 'Foliosum Edwards' shown in Fig. 8.

The sole illustration of 'Foliosum Edwards' appeared in the *British Fern Gazette*, Vol.2 June 1915 No.24, Frontispiece (Fig.8) with the accompanying text on pp. 285-286 (Fig.4).

I had thought that was the end of it and 'Foliosum Edwards' had died out. However, with the search facility

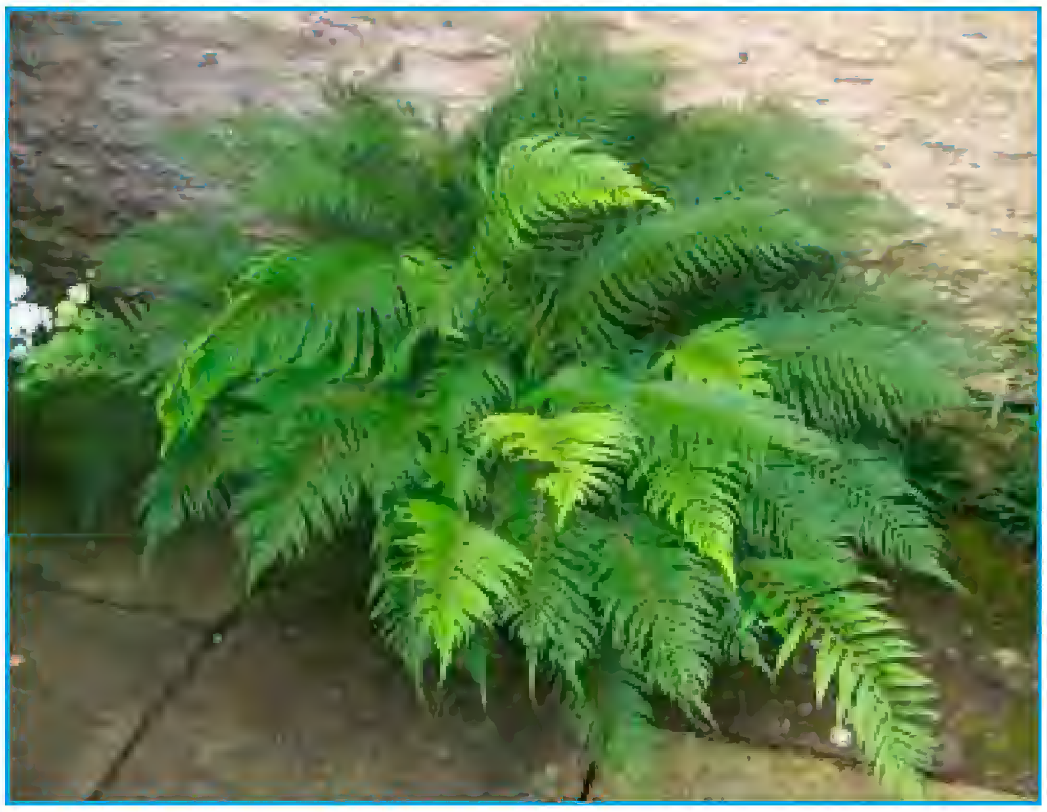

Fig. 2 *Polystichum setiferum* 'Plumosum Bevis' growing in Pamela Schwerdt and Sibylle Kreutzberger's garden, Gloucestershire. 2007

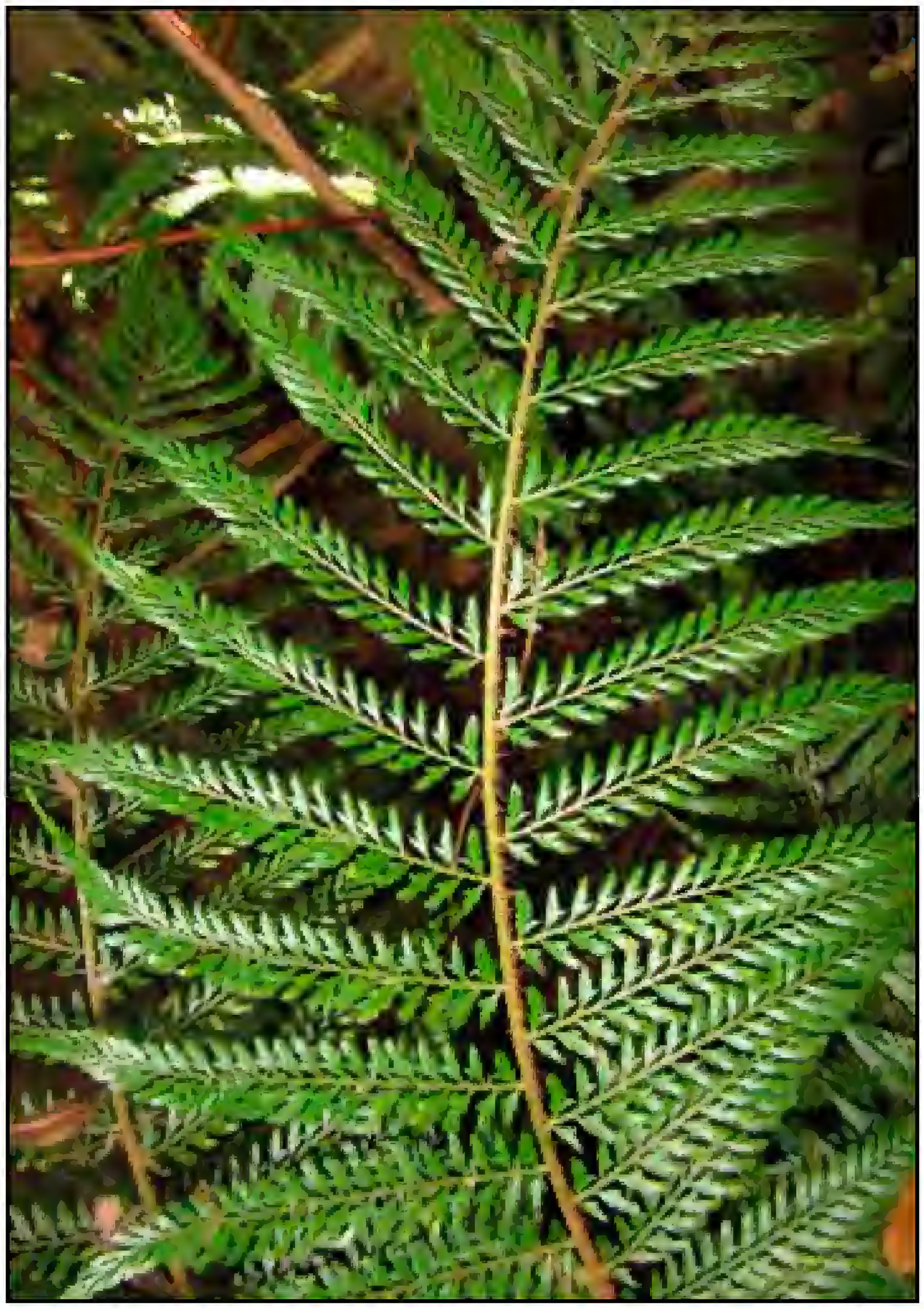

Fig. 3 *Polystichum setiferum* 'Plumosum Bevis,' February 2015. Detached three foot long frond showing typical mid frond pinnae

Back from the dead!

> In our issue of September, 1914, we gave some account of the remarkable origin of this strain in the hands of Mr. J. Edwards, and we have only to ask our readers to compare our illustration with any of those of the " gracillimum " strain, not only of the same species *P. aculeatum,* but also of practically the same plant (since the parent was a division of the one solitary Dorset find), of which the history is so well known, in order to bring home to them the extraordinary difference between them. The "gracillimums" originated as direct sports from several sowings of the spores of *P. ac. pulcherrimum* to the extent roughly of thirty per cent of the crops raised by the writer and by Mr. C. B. Green. Only one showed a different character, viz. Mr. Green's plumosum, which, however, still agreed with the rest in its display of delicate, slender dissection. Induced by these results, Mr. Edwards, finding some spores on his division of the same plant, sowed these in the hope of acquiring, if not the gracillimum type, at any rate a batch of the beautiful parental one. Twice did he sow such spores, but, unlike his predecessors, he obtained no parentals, and only about eleven which were not reversions more to the angulare type than that of aculeatum, thus agreeing somewhat with Messrs. Druery and Green's experience so far as reversions were concerned. All these eleven, however, extraordinary to state, two in the first crop and nine in the second, were of the beautiful and new foliose type we figure, and not a single gracillimum nor pulcherrimum appeared. This, therefore, constitutes one more of those inexplicable varietal phenomena which ferns present from time to time, and is, in our opinion, unique in this case, as it is practically one and the same parent, which in different hands, but certainly under similar culture, has yielded such extremely diverse and opposite results, tending in the one case to extremely fine dissection and tenuity, and in the other to dense and expanded folioseness.
> Chas. T. Druery, V.M.H., F.L.S.

Fig. 4. Extract from *British Fern Gazette* Vol.2 No.24

CD provided with BPS Special Publication No. 11 prepared by Michael Hayward, I was able to search the *Gazette* contents more thoroughly . I was pleased to find three more mentions suggesting it survived quite a while longer.

A few years later, in 1922, 'Foliosum Edwards' again gets a mention, albeit fleeting, in the *British Fern Gazette* Vol.4, 1922, p.209 (Fig.5 below).

> ...the following certificates were awarded:- .....
> To Mr. J. Edwards, Manchester :—
> For *Polystichum aculeatum pulcherrimum foliosum,* Edwards,
> and for *Lastrea pseudo-mas fimbriata-cristata angustata,* Cropper.

Fig. 5. Extract from *British Fern Gazette* Vol.4

So it had survived World War I, contrary to what I believed when I wrote the piece about 'Foliosum Edwards' in *Polystichum Cultivars*, 2005, British Pteridological Society Special Publication No. 7. Much later it is mentioned as being listed in Dr Stansfield`s collection in *British Fern Gazette* Vol.6 June 1933 No. 8 p.216. In 1939 an article by W B Cranfield was published in *A brochure, Xmas 1939* issued while the *British Fern Gazette* was suspended during the Second World War. The article, on page 7 was headed POLYSTICHUM ACULEATUM GRACILLIMUM. The relevant section is reproduced in Fig. 6.

In the earlier text by Druery (Fig.4 above) he states that Edwards raised 11 plants from two separate sowings, not 3 as suggested by Cranfield here. Cranfield`s collection was left to the Royal Horticultural Society in his will in 1948. It is not known how long it persisted there. Subsequently in *British Fern Gazette* Vol. 8 No. 4 p. 104, 1954. Percy Greenfield mentions 'Foliosum Edwards'; without stating whether or not it still existed (Fig.7).

> The late Mr, Joe Edwards, of Manchester, one of the earliest members of our Society, found spores on his ***pulcherrimum*** Bevis, from which he raised a number of plants, mostly of parental form, save three which were of foliosum character. I have these plants in my collection. They are so unlike plants raised from similar sources that unless one knew the raiser, serious doubts would arise as to the parentage. It is perhaps worthy of note that when I saw Mr. Edwards's *pulcherrimum* Bevis, from which the sowing was made, the fructification was much more marked than was the case with the other plants from which *gracillimums* were raised. The plant was extremely robust, and growing in a conservatory. The late Mr. Joe Edwards was an enthusiastic amateur florist, who, in addition to ferns, cultivated and raised Auriculas, laced Polyanthus and pinks, and what were, in those days known as Florists' Carnations, interests common to both.

Fig. 6. Extract from *British Fern Gazette* Vol.6 No.8

> This variety is not only an extremely fine one in itself, but from the few spores which it has produced splendid varieties have been raised, particularly the gracillimums and Green's plumosum, and subsequently, from a different offset in the hands of J. Edwards, a dense foliose form. Some flourishing plants of Bevis are in the hands of members, and it is hoped that a constant watch will be kept for spores— a careful scrutiny may be necessary, as the sporangia may be of a peculiar type. A sowing could hardly fail to produce valuable progeny. The raising after a blank period of many years of a good fern to which the Society's Certificate could properly be awarded is much to be desired.

Fig. 7. Extract from British Fern Gazette Vol.8 No.4

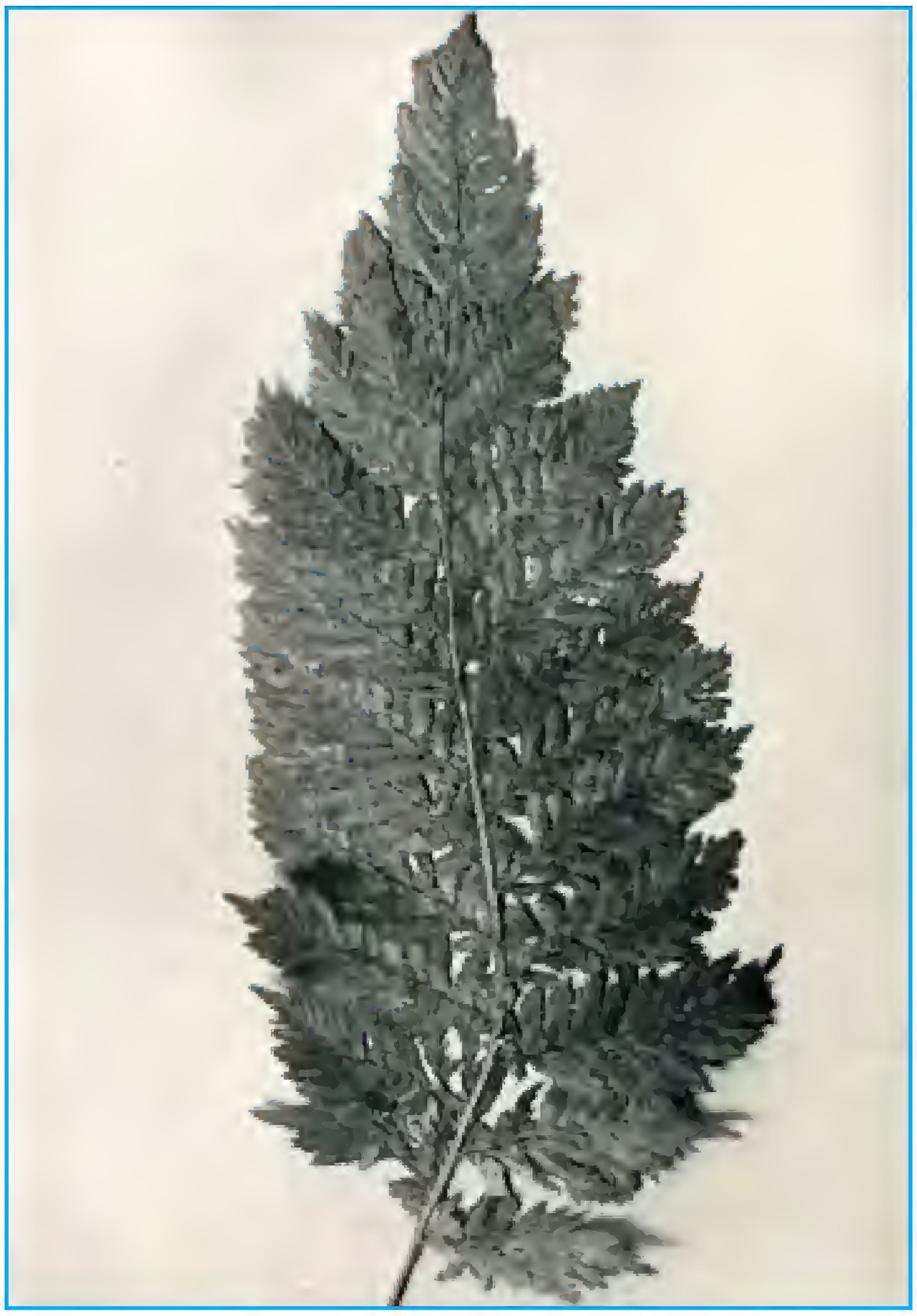

Fig. 8 . Original illustration of 'Foliosum Edwards' from the *British Fern Gazette* in 1915

Back from the dead!

At this time I thought 'Foliosum Edwards' had been a chance contaminant sporeling which came up in Edwards's sowing of spores of 'Plumosum Bevis' and I said as much in *Polystichum Cultivars*. With only one immature frond to go on such a dramatic break in one generation seeming so unlikely. I now think I must reconsider this opinion because all is not lost! Our former Dutch member Cor van de Moesdijk, has been sowing spores from 'Plumosum Bevis' for many years. He first found spores on 'Plumosum Bevis' in 1984-1985. In the first and later sowings some 30 or more 'Gracillimum' type plants were raised, of which the fairly well known 'Green Lace' was the best growing form. It was more robust and differed slightly from the normal `Gracillimum'. Some 20 or so 'Gracillimum' still are in Cor`s possession, the others have been given to people interested. Cor has generously given me a division of his original plant of 'Green Lace'. It is not from tissue culture.

Apart from 'Green Lace', Cor also raised crested forms of 'Plumosum Bevis'. Unknown to me, Cor had some other plants, which were very slow growing, two of them resembling 'Foliosum Edwards', one plant better than the other. Last year he sent me the pictures. Reproduced on this page are two of the pictures he sent (Figs.9 & 10).

At first glance any resemblance to 'Plumosum Bevis' is not very obvious. Closer examination shows the pinnules are falcate, as in 'Plumosum Bevis'; the pinnules are very feathery and plumose and the plant, like all plumose 'Plumosum Bevis' progeny, does not spore (except see below). It is sterile.

Comment from Cor: "Spores of 'Plumosum Bevis' do often give a fair number of normal fertile *P.Setiferum* plants, in which the special character of Bevis is undoubtedly recognizable. These plants can be fully covered with spores. The 'Plumosum Bevis' group of sporelings vary slightly one to another and isolated spores are sometimes found on one plant and next year on another plant, but very occasionally you can find one pinnule fully covered with spores (this happened twice with my plants), while the rest of the plant does not contain any spores on the other 20 or so fronds. One must remember that isolated sporangia once found have to be marked immediately; it is very difficult to find it back some days later and nearly impossible to find it back some two weeks later."

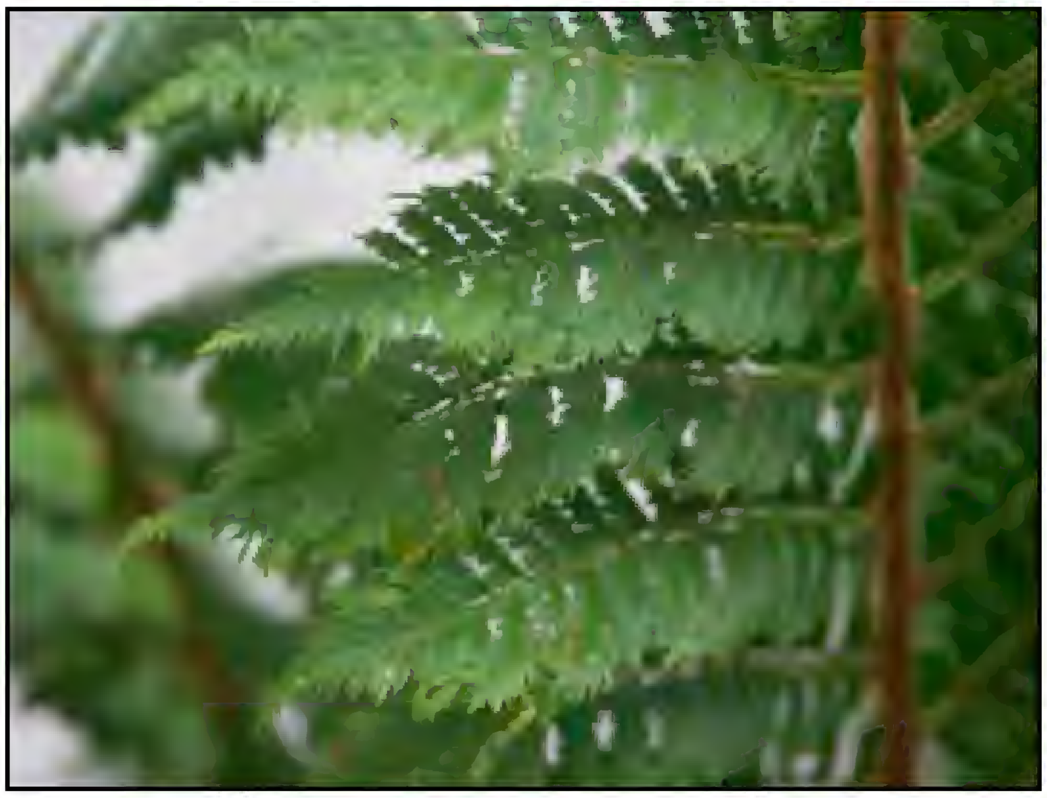

Fig. 9 Close up of pinnae of Foliosum group plant sent by Cor van de Moesdijk in 2014

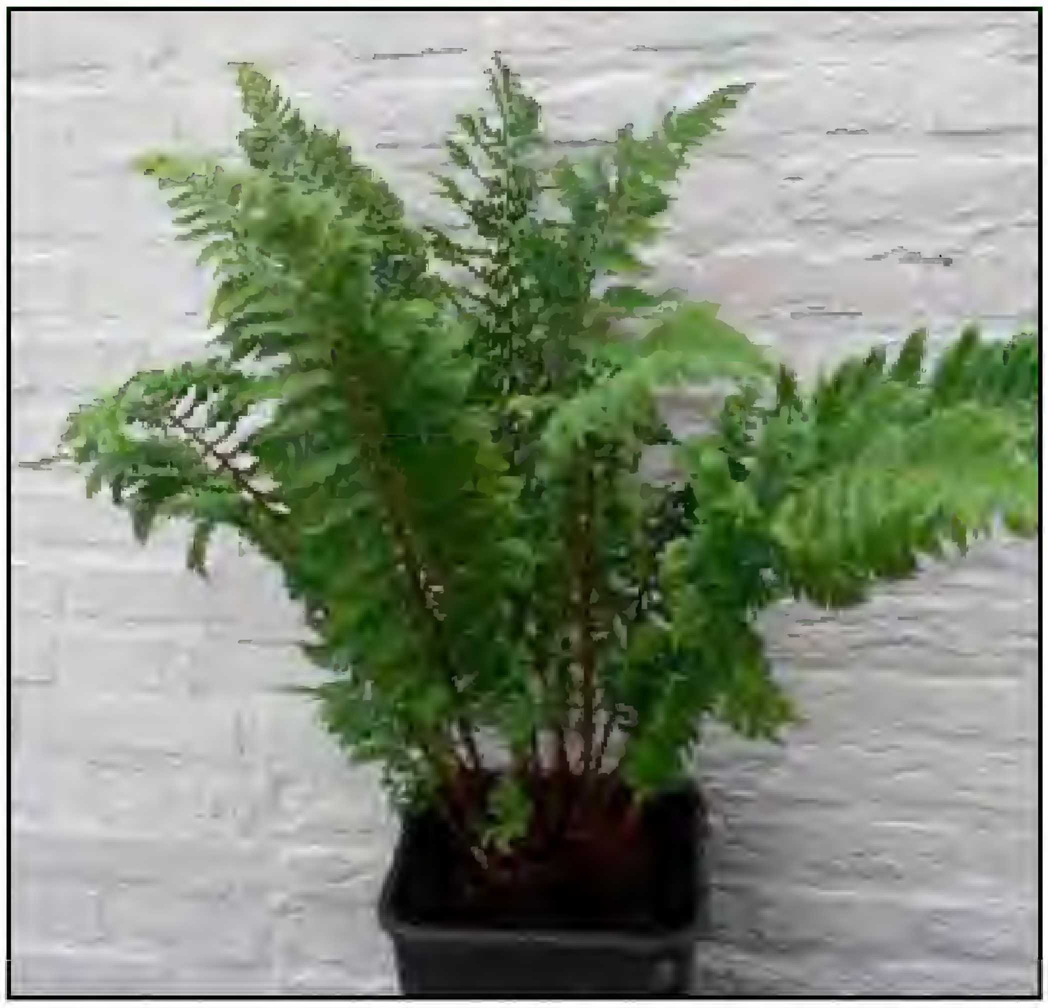

Fig. 10. Mature plant of Foliosum group sent by Cor van de Moesdijk in 2014

He further says: "From the descriptions in the *Gazette* I conclude that Mr Edwards's Foliosum plant came from a division of the original 'Plumosum Bevis' plant. I had the same experience; from my comparable sowing I had a lot of normal plants of *P.setiferum*, only two plants of the Foliosum types, very few 'Plumosum Bevis' and no 'Gracillimum' and no 'Plumosum Drueryi'."

What do we call Cor's plant? It is newly raised from spore, it is certainly not a division of an older plant. It looks very like the one frond/picture we have of true 'Foliosum Edwards'; it may be slightly different but the differences are not clear. I feel we should call it 'Foliosum Edwards'; after all 'Plumosum Drueryi' can vary from plant to plant but all are known as 'Plumosum Drueryi'. Perhaps in both cases we should add 'group' after the name?

Edwards called his plant a foliosum and none of the great fern men quoted above questioned that. However, for me this plant is a very beautiful plumosum. I suspect it will continue to be called 'Foliosum Edwards' which in my opinion understates its beauty.

Footnote: Cor has split his plant into several crowns. One mature one shown in Fig. 10 above, then five smaller crowns about 5-10 inches tall, and some five or so very small ones (1-3 inches). It`s not yet clear, if they will survive and grow into mature plants.

With great generosity he has given me 3 of the divisions. I believe they are his best crowns. So far I have given one plant to Fibrex Nurseries as they have an excellent track record for looking after rare ferns. I have one plant in my garden and one plant looking for a good home. I can think of lots of suitable places, but which is the best??!!

This entire article is the result of Cor's skillful propagation over 30 years. I am extremely grateful to him for that, for sharing some of his experiences and for checking the details in my account so far as his work is concerned. Finally, of course, I am extremely grateful for the plants he so generously gave me in August 2014. ❒

Melville's Magnificant Multilobum

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In the summer of 2014 I had the great pleasure of meeting BPS member Melville Thomson and visiting his garden in Arnside. It was full of ferns which you can read about on page 153 but pride of place went to the amazing fern seen in Fig.1.

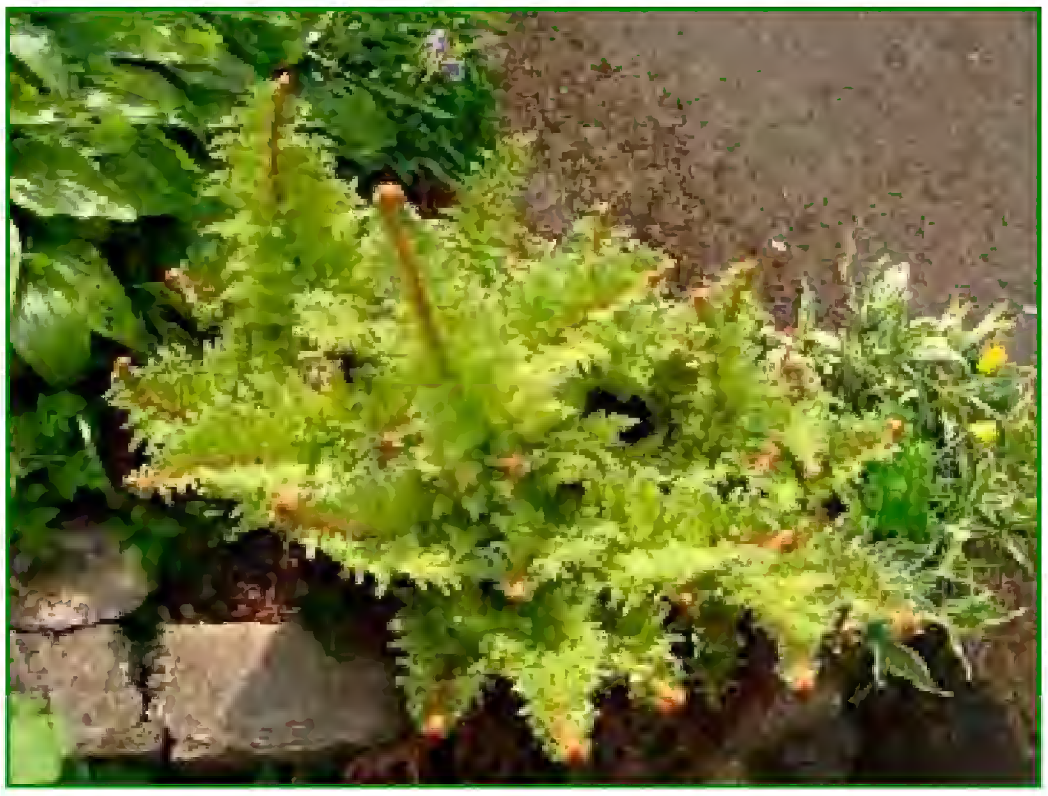

Fig. 1. A magnificant multilobum

It would be described as *Polystichum setiferum* 'Plumoso-Multilobum' but it has a long history behind it, having belonged to Melville's grandfather, Murray Thomson.

Murray Thomson was born in Rugby but his father, James, soon moved back to Scotland. Murray trained as a Solicitor and became a Factor (manager for an estate) and for 10 years, from 1898-1908, was secretary to The Royal Caledonian Horticultural Society, rubbing shoulders with the great and good in horticulture at the time and held in high regard. After a lifetime working on estates in Cumberland and Herefordshire, he retired to a village near Dundee in the 1930s. We do not actually know where the fern came from but it had been passed on to his son by 1946 which makes it 69 years old at the very least

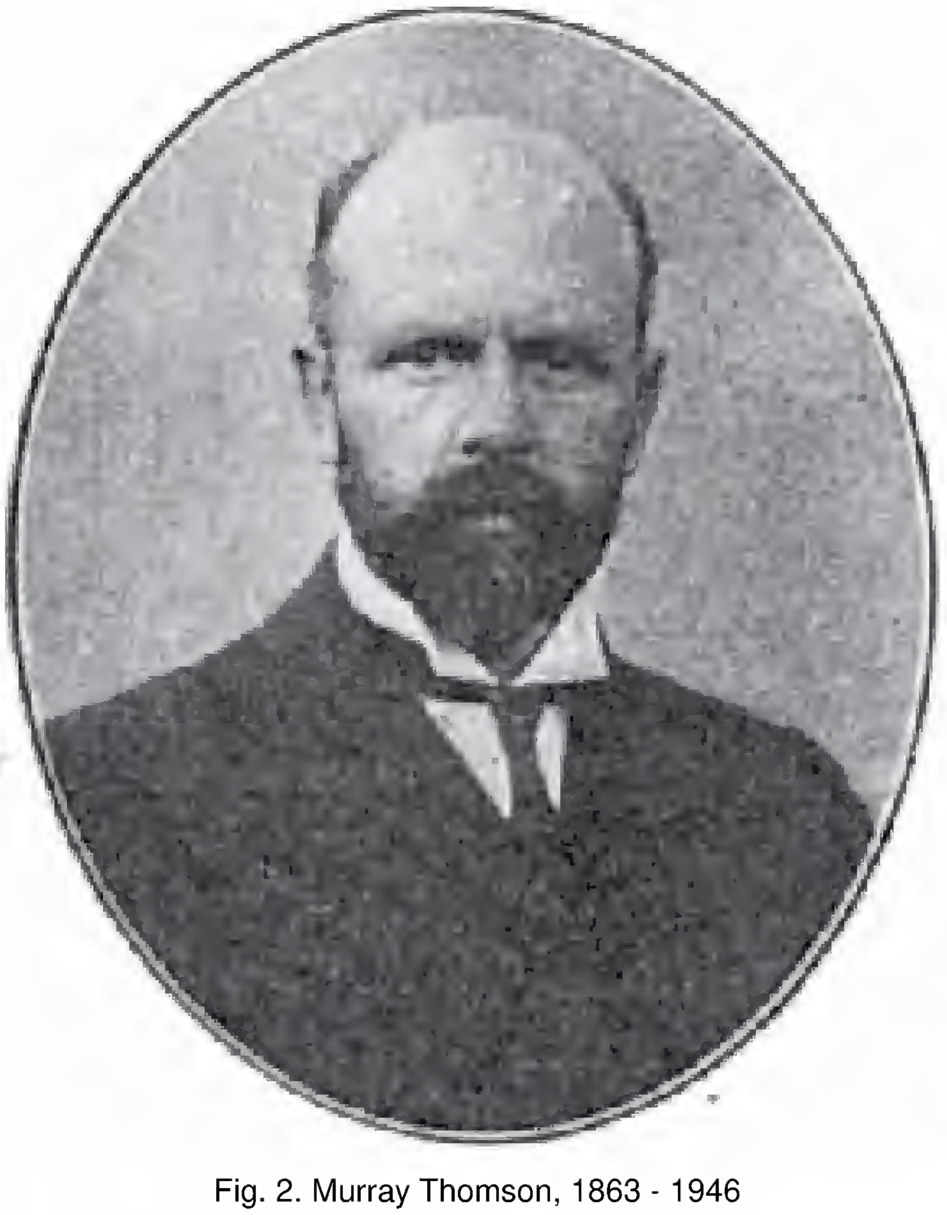

Fig. 2. Murray Thomson, 1863 - 1946

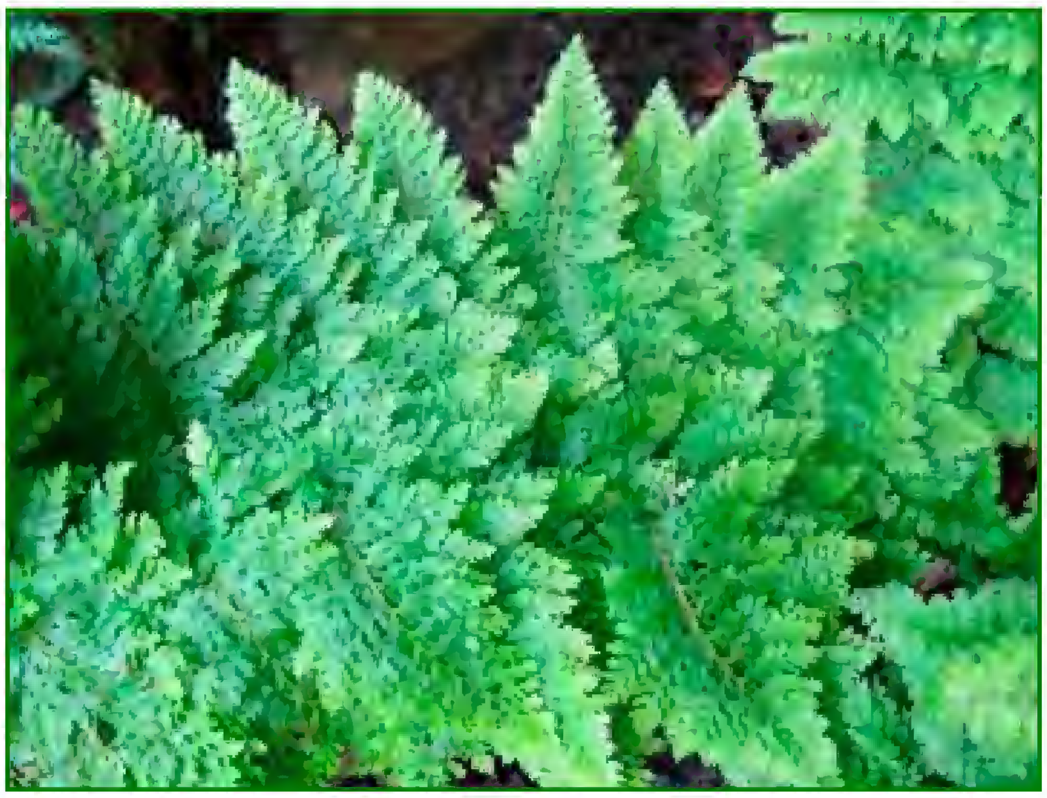

Fig. 3. Detail of a frond showing the multi-tiered effect of the pinnae development

The fern was passed on to Melville in 1968 when he moved to Arnside. It was planted in a raised bed near the house and soon became established. However the root system managed to find its way into the retaining wall. This was a substantial structure involving large rocks, concrete and a rendered finish. In order to lift the fern and divide it , it was felt that the wall had to be dismantled.

With the help of BPS member Robert Crawford, who came armed with a sledgehammer and crowbar, the retaining wall split very easily and the fern was lifted, enabling it to be shared around. It is now in the hands of at least seven people, including a fine specimen at Holehird, the holders of the National Collection of polystichums. After

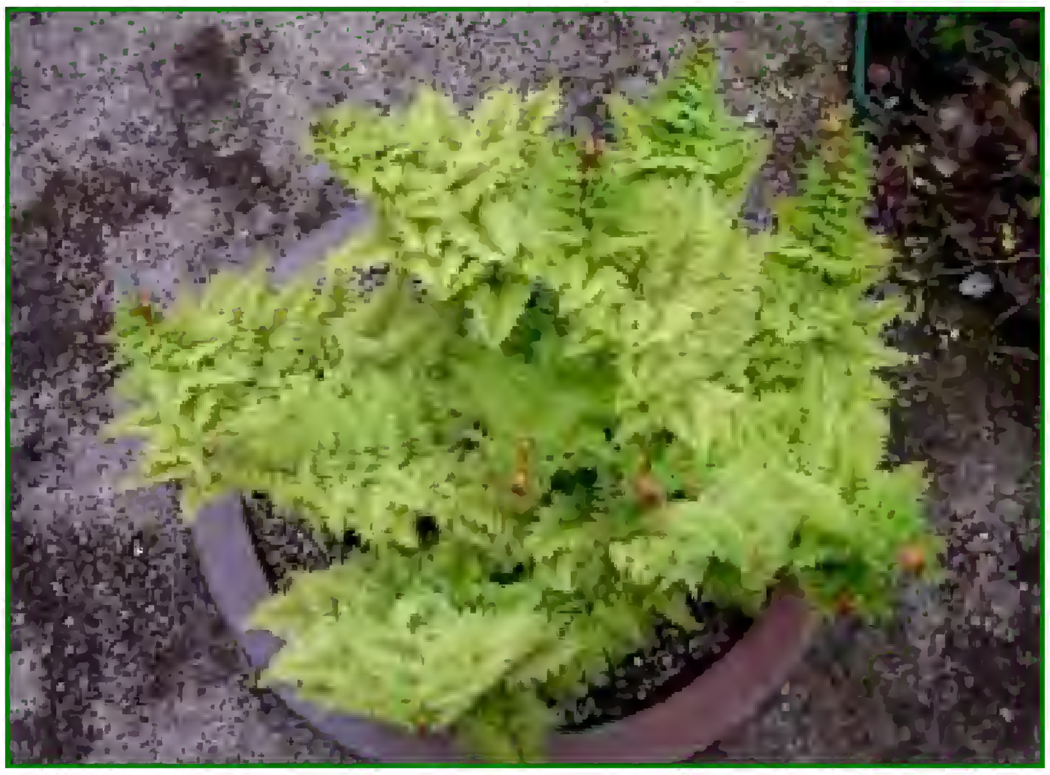

Fig. 4. The rescued fern replanted in a very large pot

discussing it with Melville, we hoped it could be given a clonal name for the divisions. At the time of our visit most fronds had not unfurled fully but the plant had all the signs of being a remarkably good clone. Provisionally we are calling it *Polystichum setiferum* (Plumoso-multilobum Group) 'Murray Thompson.' Once it has settled down in its new homes we will be able to re-assess its characters and hopefully formalise the name.

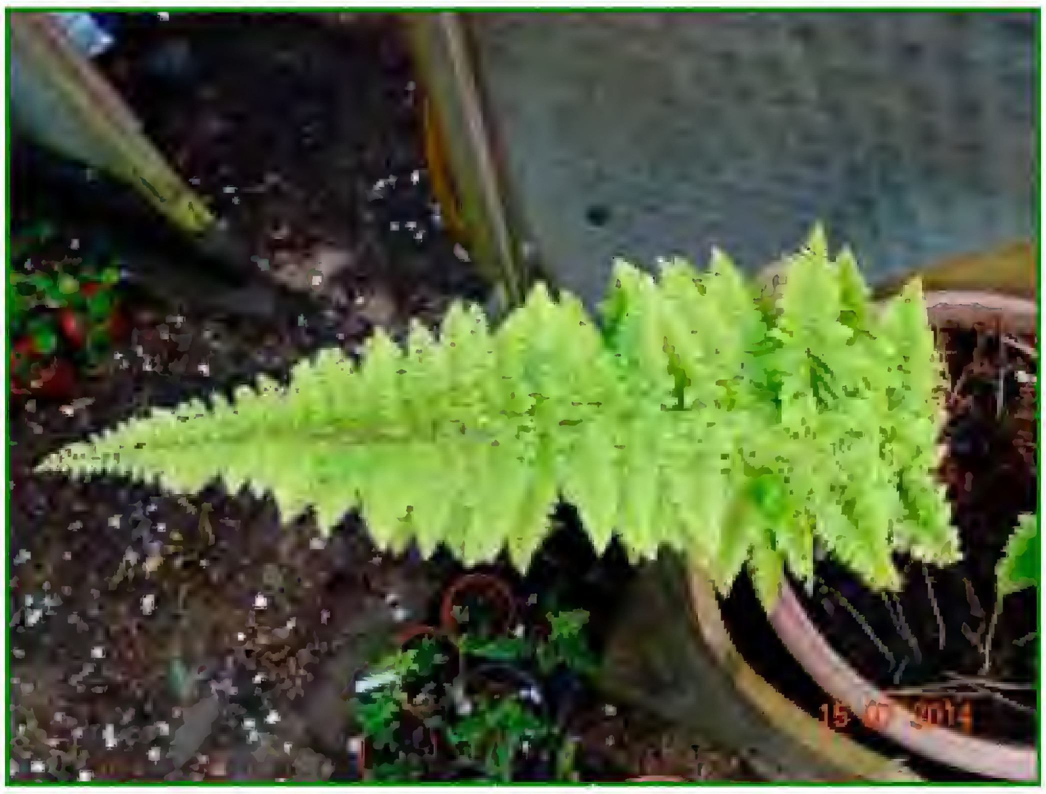

Fig. 5. A division of Melville's fern showing all the characteristics of a 'Plumoso-Multilobum'
(photo: Alec Greening)

What is a 'Plumoso-Multilobum'?

Below is a comparison chart for 'Plumoso-Divisilobum' and 'Plumoso-Multilobum' from BPS Special Publication No. 7, Polystichum Cultivars by J.W. Dyce and edited and expanded by Robert Sykes and Martin Rickard

In Fig. 6 is a pinna of Murray Thomson's fern showing the characteristics of a 'Plumoso-Multilobum.'

Colour can vary with these ferns. In shade, they are softer and greener and more developed, but in sun they are more golden but not so well developed, hence the variation of the colour in the pictures in this article. ❐

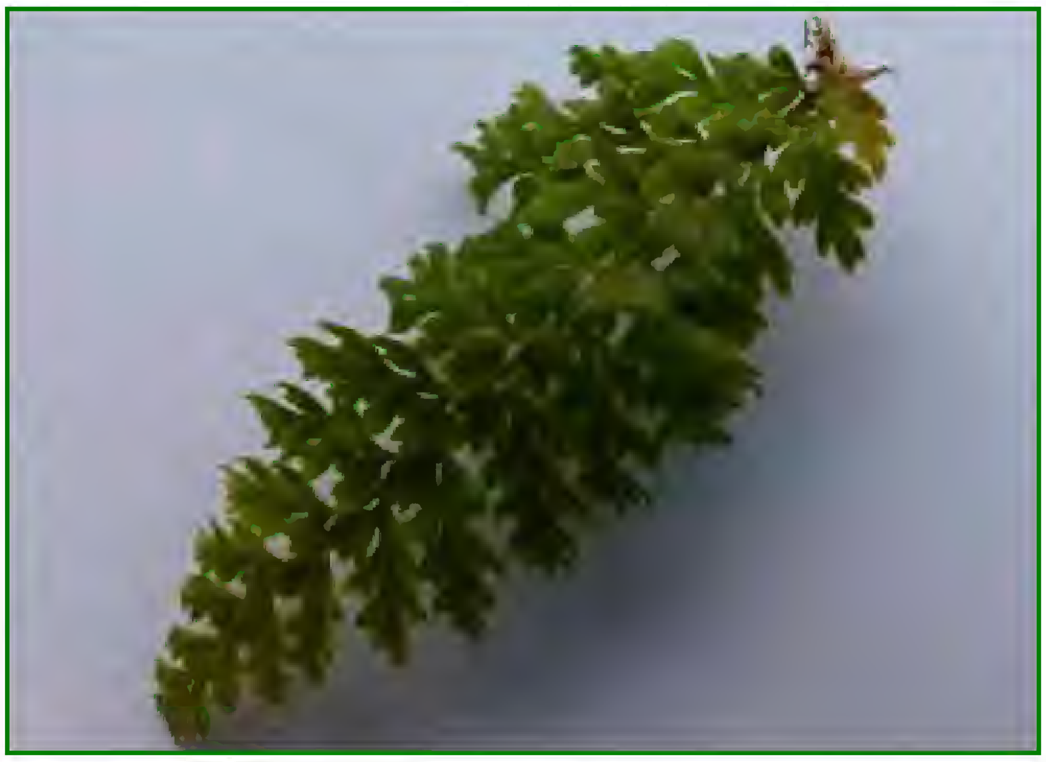

Fig. 6. A pinna showing the characteristics of 'Plumoso-Multilobum'
(photo: Alec Greening)

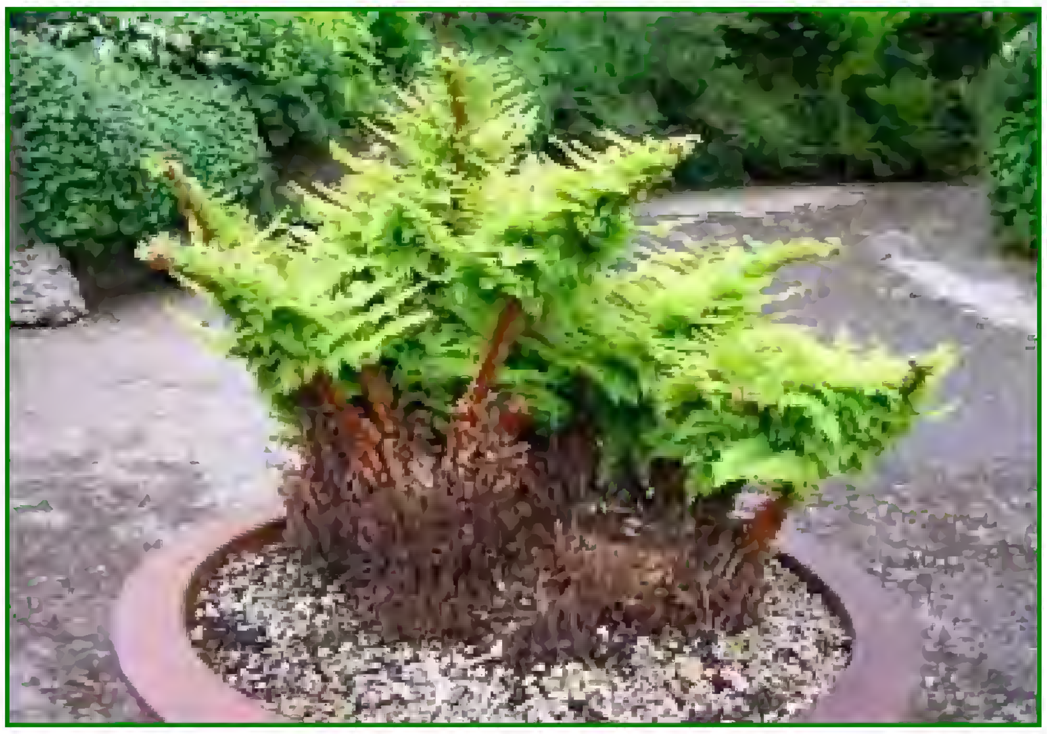

Fig. 7. The transplanted fern recovering well from being lifted from the confines of the retaining wall

Acknowledgements

I would like to thank Alec Greening, Erica Thomson and Melville Thomson for the extra photos and all their help, as well as the advice from Martin Rickard.

	PLUMOSO-DIVISILOBUM	PLUMOSO-MULTILOBUM
FRONDS	large, narrowly deltoid	large,narrowly or, more commonly, widely to very widely deltoid
PINNAE	resemble small fronds, wide, overlapping and *open-spaced*; divided into wide-spaced narrow pinnules	resemble small fronds, wide, overlapping and *very dense*; divided into wide *overlapping and dense* growing pinnules
PINNULES	finely divided into narrow, pointed and spaces pinnulets	normal, wide or narrow species shape; divided into pinnulets
PINNULETS	can be divided into very narrow, *widely-spaced* ultimate segments	divided into tiny segments with minute wide divisions, *closely congested and overlapping*
APPEARANCE	overlapping make fronds 3-dimensional but an open and light appearance is preserved; fronds are straight	dense and overlapping growth builds fronds up to a thickness of 1 inch (2.5cms) or more, making them heavy and looking like slabs of moss; fronds are often curved
TEXTURE	hard and glossy, or inclined to be so	normal species softness in touch and looks

What is the correct name for Chilean Hard Fern?

Tim Pyner

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For some time horticulturalists and botanists have had conflicting views in regard to the correct name of this commonly cultivated species of Hard Fern originating from temperate South America. All recent British botanical publications refer to the plant as *Blechnum cordatum* e.g. Jermy & Camus (1991), Wardlaw & Leonard (2005), Stace (2010), Murphy et al. (2012). Most botanical works in the region use the name *B. cordatum;* however it is of interest that Rodriguez (1995) retains the name *B. chilense.* While most botanists have accepted the name *B. cordatum* the majority of horticulturalists and gardeners insist that the correct name is *Blechnum chilense* and that *B. cordatum* is a different, tropical species. The Royal Horticultural Society uses the name *B. chilense* in its publications. It has been pointed out that plants named *B. cordatum* found in other parts of South America differ substantially from plants occurring in Chile e.g. Rickard (2000, 2012), Olsen (2007). In an effort to clarify the situation I have spent some time researching the names and studying the plants involved.

The problem can be divided into two parts. Firstly what is *B. cordatum,* where does it originate and is it the same as our plants? Secondly are all the plants under this name the same species?

The rules governing the naming of plants are known as the International Code of Nomenclature for Algae, Fungi and Plants. This was, until 2012, known as the International Code of Botanical Nomenclature. One of the guiding principles is that the oldest name for plant has priority and should a generic transfer occur the specific epithet is retained wherever possible. In our case the 2 names were both published within the genus *Lomaria. L. cordata* was published by Desvaux in 1811 and *L. chilensis* by Kaulfuss in 1824. At first sight *L. cordata* was published several years before Kaulfuss's name and has clear priority. The type locality on the collection label is given as Perou [Peru]-Concepcion. Does this suggest a more tropical origin for *L. cordata*? However, as explained by Tryon & Stolze (1993), the collector of the type, Joseph Dombey, did not visit or collect in or near a Concepcion in Peru, but did travel from Peru to Concepcion in Chile, where he evidently collected the plant. So an error on the locality details has provided some confusion. I have examined an isotype (duplicate original collection) of Dombey's fern in BM along with a photo of the holotype and they appear to match typical plants of *Blechnum chilense* as seen both in the wild and in cultivation.

Plants of *B. cordatum/chilense* in cultivation display some variation, some of which is environmentally induced. Plants growing in permanently wet habitats in mild areas can be considerably larger and more robust than those growing in drier, less humid places. As usually seen it is strongly stoloniferous with mid to dark green, leathery fronds. The pinna margins are sharply toothed and strongly undulate. Less commonly, plants occur with pinna margins barely undulate. In mild oceanic gardens extensive colonies can form from the vigorous stolons. Sporelings are frequently seen in large Cornish gardens and it is starting to spread from gardens into semi-natural habitats (Murphy et al. 2012). Most or all of the plants in cultivation originate from Chile. If plants or spores are obtainable from other areas it would be of considerable interest to grow and compare them under similar conditions. If anyone does happen to have plants from other countries in their collection I would be very pleased to hear from them.

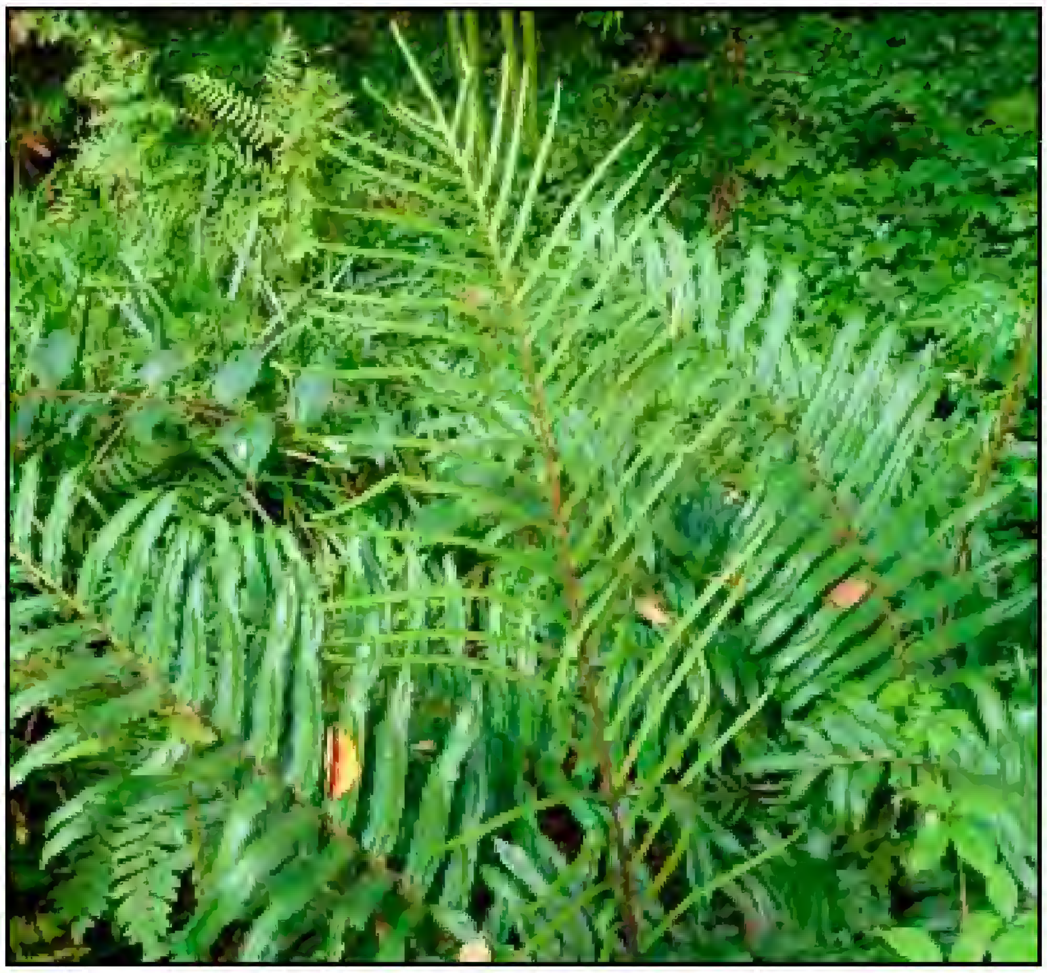


Fig. 1. *Blechnum cordatum*, form with flattish fronds, in Koen van den Berg's garden, Belgium

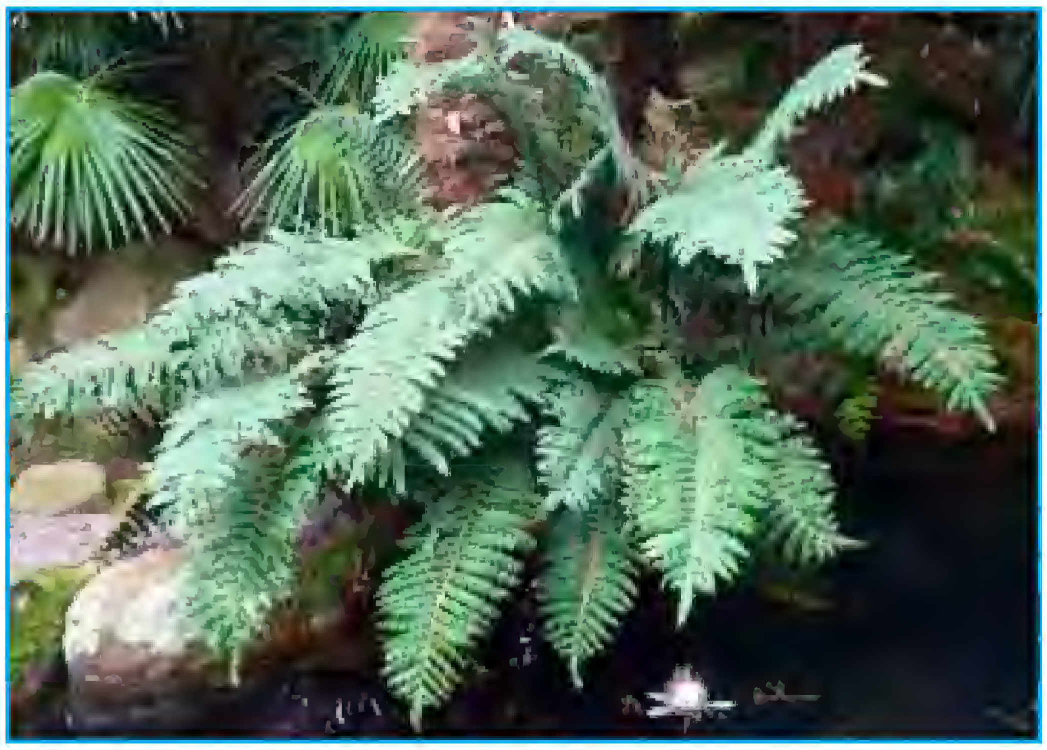


Fig. 2. *Blechnum cordatum*, typical form, Lamorran, Cornwall

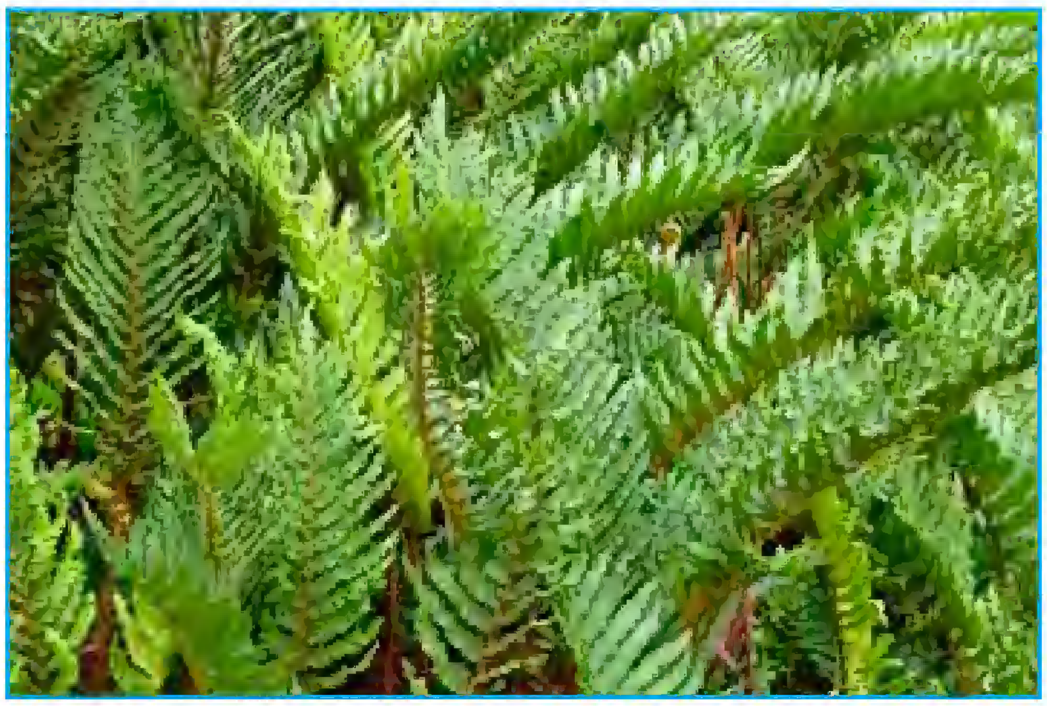


Fig. 3. *Blechnum cordatum* also grows well in eastern Britain given sufficient moisture, How Hill Farm, Norfolk

The second problem, the identity of ferns from elsewhere in South America named *B. cordatum,* is rather more difficult to resolve. It is a member of a morphologically well defined group with *Blechnum*, section *Parablechnum.* A recent molecular study (Perrie et al. 2014) demonstrates that this group (as the *B. procerum* clade) is well supported. Species of this group are found throughout the southern hemisphere extending northwards to Mexico in the New World. Features that characterise the section are the dimorphic fronds, the sterile being completely pinnate i.e. the pinnae are joined to the rachis by a small stalk, at least at the lower part of the frond. Also the terminal pinna resembles the lateral ones and stoloniferous rhizomes are usually present. The group includes the *B. procerum* aggregate from Australasia, *B. capense* from Africa and Madagascar and several species in Malesia and islands of the South Pacific. Around 60 species are currently recognised, with about 30 in the Americas. At least 12 names, including *B. chilense,* have been synonymised with *B. cordatum*. Studying the collections at BM reveals that many of these species are probably correctly included within *B. cordatum*. The plants vary in size, texture and particularly in pinna shape. I can certainly understand why they have been classified as a single variable species. However some such as *B. ornifolium,* with thin textured fronds and pinnae with tapering bases, look very distinct. Furthermore there are other currently recognised species, such as *B. schiedeanum* from Mexico, that appear almost indistinguishable from *B. cordatum.* Further research into the whole group in the New World is obviously required and this has been pointed out by botanists on several occasions e.g. Mickel & Smith (2004). This must include molecular and cytological data as morphology alone is clearly insufficient to discriminate species satisfactorily. As currently understood *B. cordatum* occurs from the southern tip of South America northwards to Colombia and Venezuela. It also occurs on the Juan Fernandez and Falkland Island archipelagos. In the northern part of its range it is restricted to montane habitats but in Southern Chile and Argentina it is found at much lower altitudes.

A distinctive fern found by Martin Rickard in Ecuador belongs to this group and has provisionally been named *B. cordatum* (Rickard 2012, 2014). It has astonishing unfurling fronds coated with slime that drips off the croziers. Also it has distinctive elongated horn-like aerophores that poke through the slime and enable gas exchange to occur in the young fronds. I suspect this plant is *B. lechleri* (Figs.4 and 5); however information on this species is hard to find. It is illustrated on the Ferns and Lycophytes of the World website (www.fernsoftheworld.com).

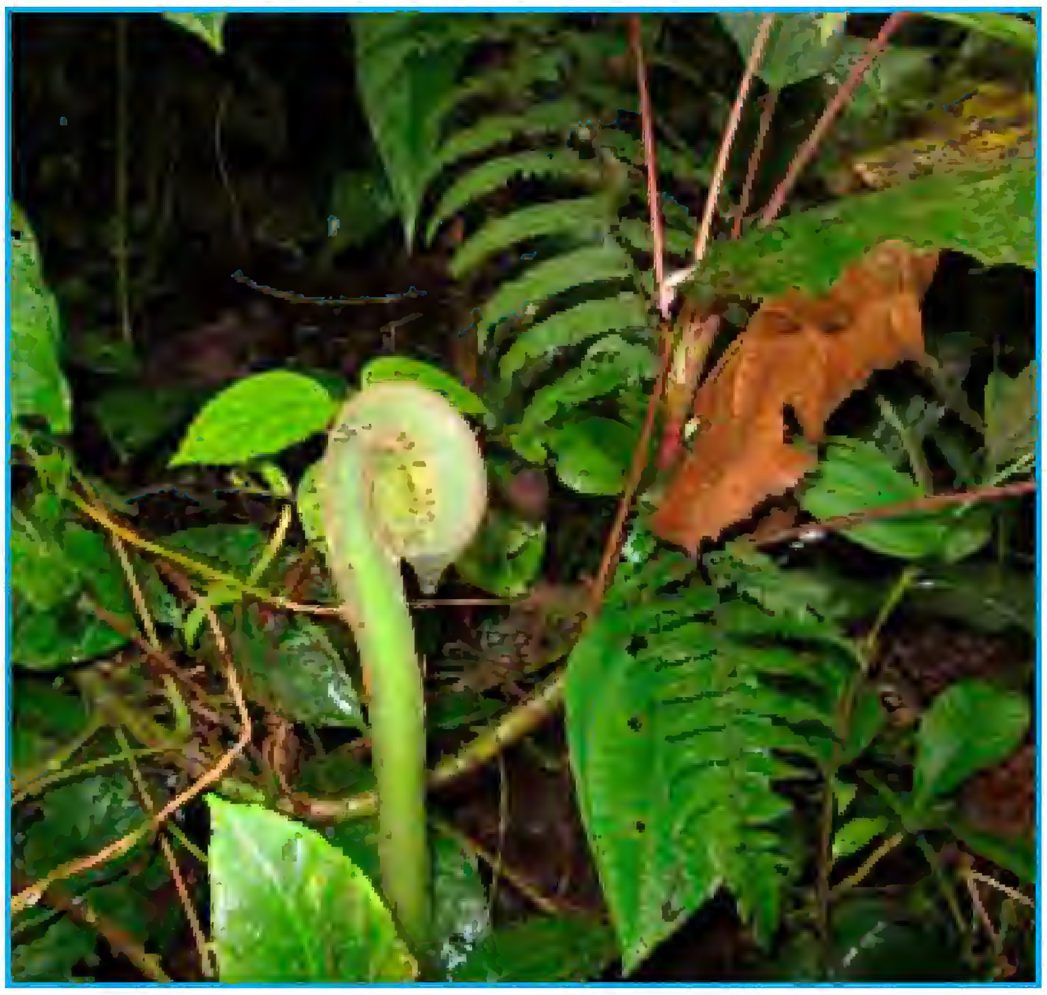


Fig. 4. *Blechnum lechleri*, San Rafael waterfall, Ecuador, crozier covered in slime
(Photo: Martin Rickard)

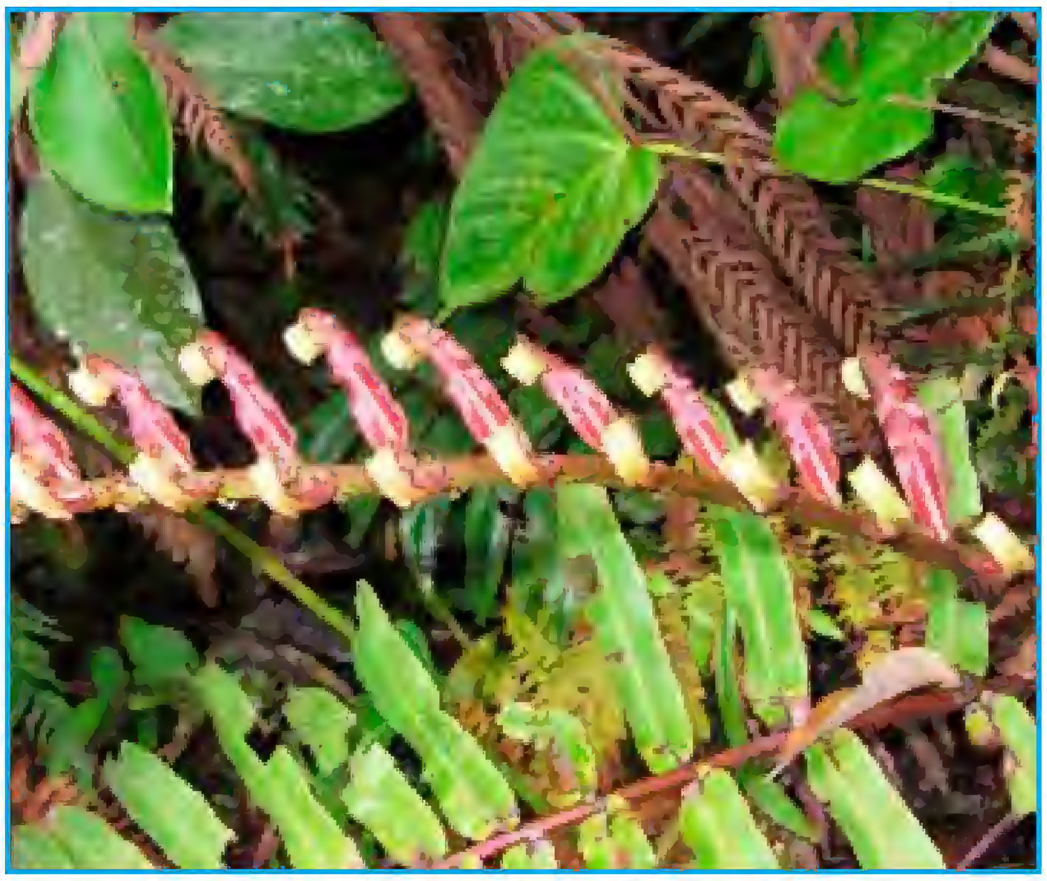
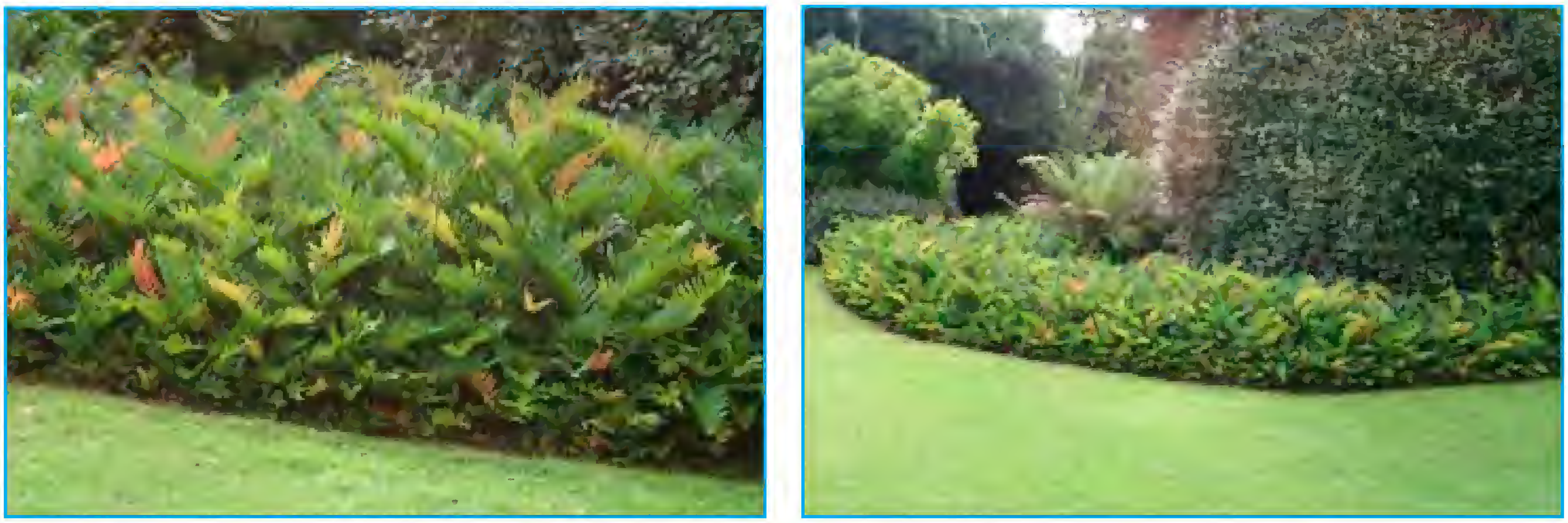


Fig. 5. *Blechnum lechleri*, unfurling frond
(Photo: Martin Rickard)


Figs 6 and 7. Two views of *Blechnum cordatum*, often seen as large spreading colonies in western Britain, taken at Abbey Gardens, Tresco

To summarise, the type specimen of *Blechnum cordatum* was collected in Chile and it matches wild plants and those in cultivation named *B. chilense*. It would appear that, whatever the status of some tropical ferns currently included under the name *B. cordatum*, the latter name applies to the species from temperate areas of South America. Therefore, I am convinced that botanists are correct to use name *B. cordatum* and I recommend that this name be used for plants in horticulture. ❒

Acknowledgements

My thanks to Alison Paul for her help at the Natural History Museum. Also to Martin Rickard for his views on this controversial subject.

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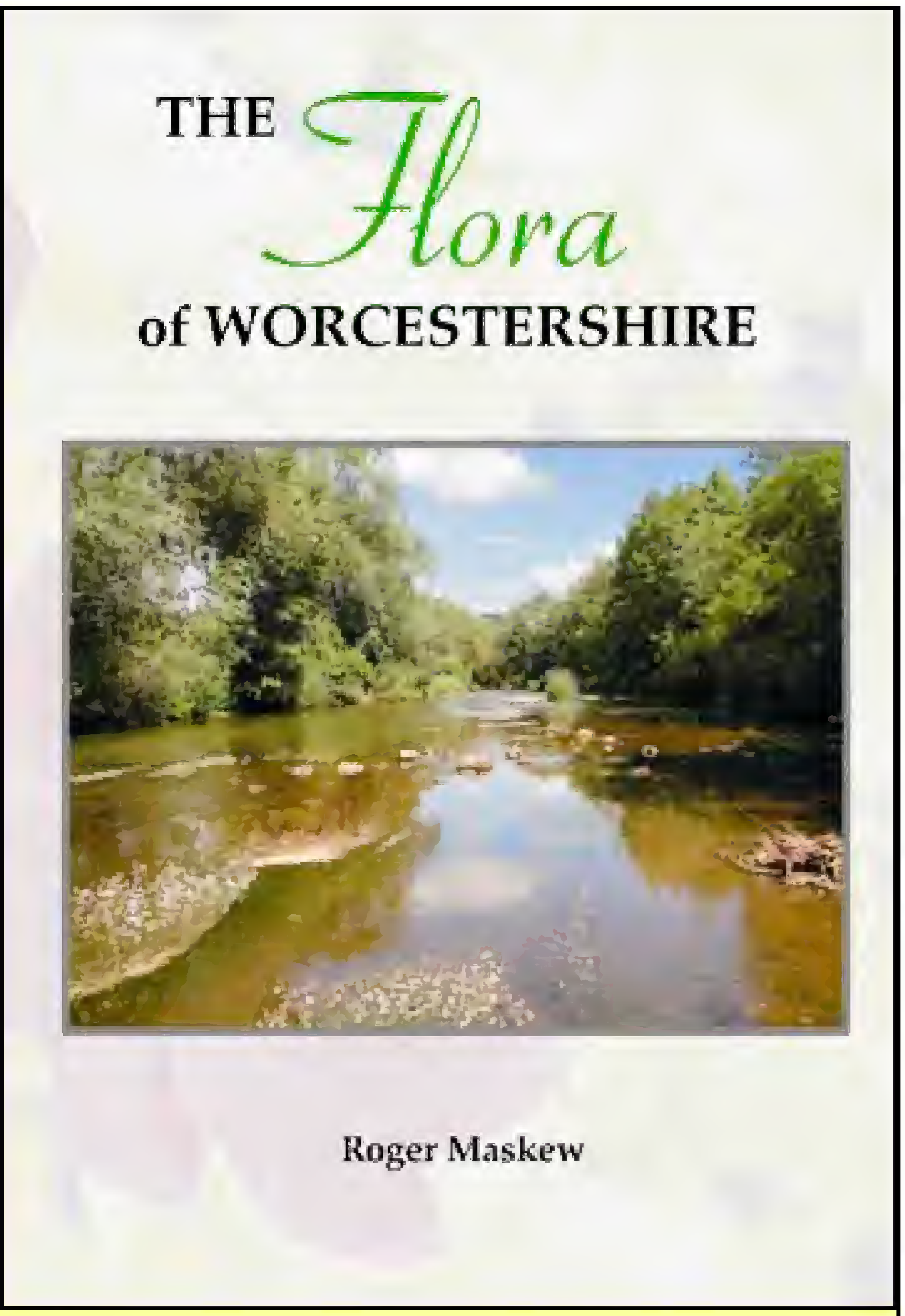
BOOK REVIEW

The Flora of Worcestershire by Roger Maskew. 810 pp., numerous col. pls., 2014. Hardback. ISBN 978-0-9926693-0-0. Published by the author. Price £47 including postage from the author at Coppice House, Bannals Lane, Stoke Bliss, Tenbury Wells, Worcs. WR15 8RZ. Please make cheques payable to R.Maskew. Callers can save the postage and buy the book for £40!



There have been few county floras which I welcome more than this one. I live in Worcestershire and the author lives only just over one mile away! This huge tome has taken up much of the author`s time for 15 years since his retirement. Time well spent! Research into old records, particularly from Worcester Museum, has been added to the results of more modern botanising. Considering Worcestershire is largely lowland, apart from the Malvern Hills, and has pretty cold winters and lowish rainfall, the fern flora is better than you might expect. Tantalisingly quite a few species appear to have been lost but full information on all early records is given here to tempt renewed searches. Local rarities which might be found or refound include *Diphasiastrum complanatum* agg., *Huperzia selago, Osmunda regalis, Cryptogramma crispa, Asplenium viride, Gymnocarpium dryopteris*, and rather fascinatingly, *Polypodium australe* (*P.cambricum*). Several interesting cultivars of *Polystichum setiferum* have been found locally, suggesting there is a good potential for more hunting. The *Dryopteris affinis* complex is investigated in depth with a surprisingly large number of taxa recorded for the county largely following Ken Trewren`s arrangement. Throughout four figure grid references are given, and where there are several records a distribution map is given based on records collected during the survey period of 1987 - 2004

Introductory sections include extensive accounts on the geology, climate and land use in the county. These are followed by descriptions of the habitats of Worcestershire, discussions of the changes in the county since the last full flora by Amphlett and Rea in 1909 and a full account of the history of recording in the county from 16th century through to today. These early sections run to 117 pages in total while the actual flora covers an additional 645 pages. I think this speaks volumes for the detailed coverage of the flora of the county given in this excellent book.

Martin Rickard

Weevil damage on ferns, mainly polypods

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In the 2010 issue of the *Pteridologist* (Vol. 5 Part 3, pp.175-176) I wrote an article I called 'Fern Deaths', all about problems I was having in my garden. I described my efforts to discover the cause and subsequent efforts to try and solve the problem. Since then things have moved on sufficiently for me to give an update on progress.

Diagnosing the cause of the problem

Crown forming ferns were dying, one or two fronds at a time, creeping ferns were dying also with fronds being shed at random throughout a clump. In many cases a white grub was found to be boring inside the leaf base. I believed this to be Australian Fern Weevil but could not prove it. This weevil had been recorded as a fern pest in the UK since 1902, but had slipped under the radar over the last 50 to 100 years.

The series of photos below on a single frond of *Polypodium australe* 'Pulcherrimum Addison' illustrate rather well how this frond has not fully wilted even though it had been shed. The puncture hole where the weevil laid its egg is neat and small and very easily overlooked. On splitting you should either find an egg or a larva. If nothing is found the likelihood is the larva has migrated into the rhizome.

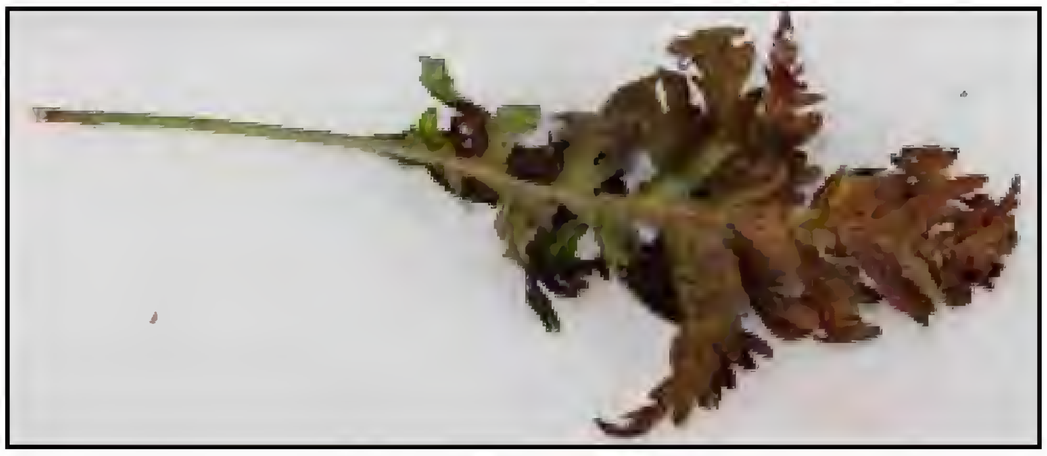

Fig. 1. Year old frond of *P.australe* 'Pulcherrimum Addison' showing apparently natural end of season wilting but examination of frond base shows the mark where the weevil egg has been laid

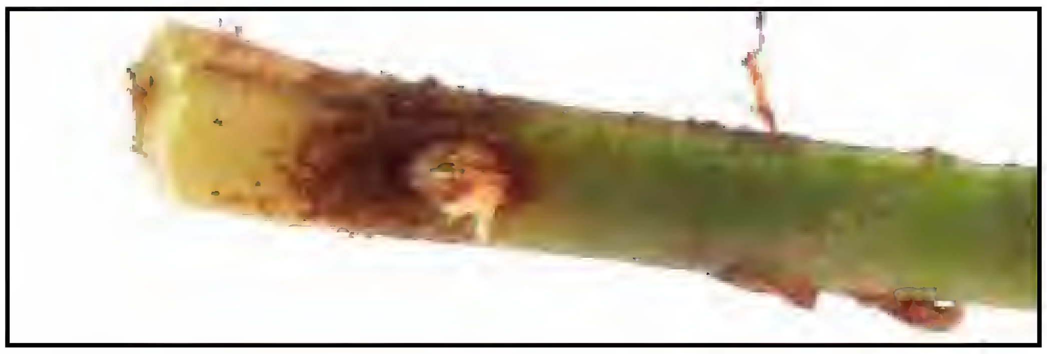

Fig. 2. Base of frond of *P.australe* `Pulcherrimum', showing closer view of recent puncture. Cut at ground level at left hand end

On splitting the frond at the puncture point I usually find a tiny egg or a very young insect larva. In the above frond it was an egg:

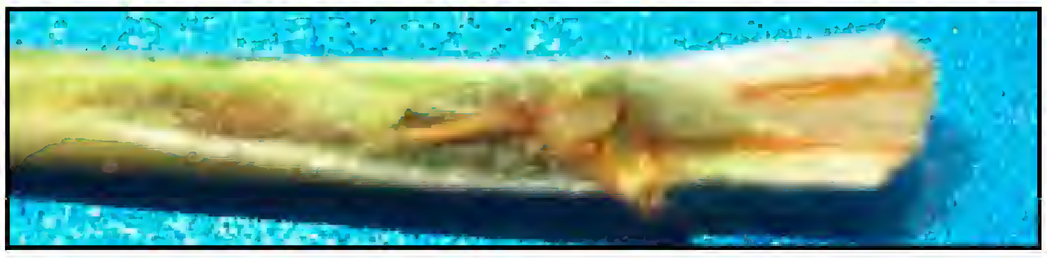

Fig. 3. Above frond split at base showing the weevil`s egg. The rachis width is about 3 mm, so the egg is less tham 1 mm wide and just over 1 mm long

There does not appear to be a regular seasonal life cycle for this pest. While this egg was found in one frond another enclosed a larva much more fully developed. This frond was a year old yet there was a very healthy larva not far from its entry hole.

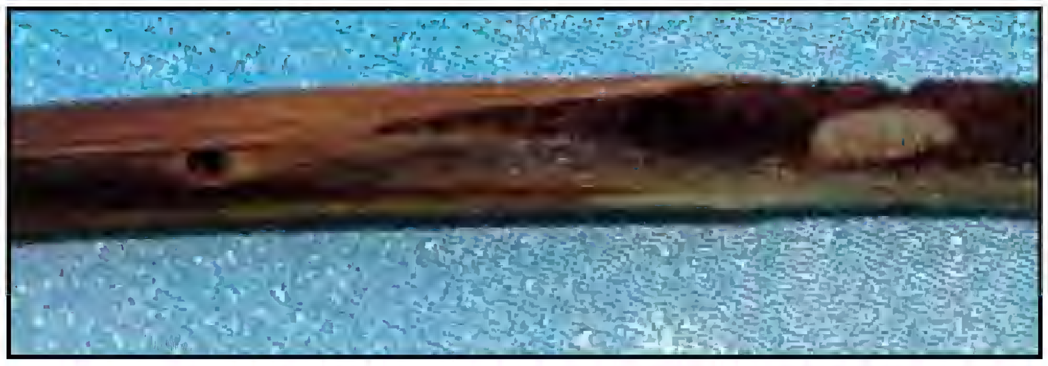

Fig. 4. Another frond of the same cultivar picked at the same time (6th July 2014). Here you can see the original puncture is clear and the egg has hatched and we now have a larva, still about 1 mm wide but now 3 mm long

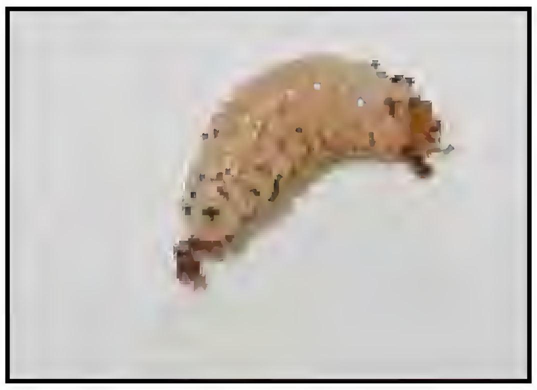

Fig. 5. (left) Shaken free from the frond base the larva does look like a vine weevil but at only 1 mm wide it seems much smaller. Also I have never seen one of these larvae free in the soil as is often the case with vine weevils

I have known my problem was probably a weevil for several years but I had never seen an adult. I knew it was not vine weevil. Vine weevils are common on virtually any type of fern, especially *Asplenium scolopendrium*, when grown in pots. Infested pots can sometimes have 20 or more vine weevil larvae free living in the soil in close proximity to the plant. In open ground problems with vine weevils are rare, but the pest in question here thrives in a garden situation, yet I have never seen a larva free living in the soil, it is always either in the frond, stipe or rhizome. Vine weevil larvae are chunky and quite fat, these larva are of necessity very slim as they live for some weeks feeding up the rather narrow rachis cavity before moving down into the rhizome. They move up the stem then turn around to move back down to the rhizome. Given the width of the rachis it is amazing that the larvae can turn around. Once the larva has left the rachis for the rhizome the leaf falls off and the base of the severed rachis is obviously hollow.

This autumn, 2014, I was checking through for detached fronds and picked up one with a lump of dirt on it. I brushed the lump of dirt prior to splitting the rachis before I realised it was not dirt, it was an adult weevil! At last here was the absolute proof that the Australian Fern Weevil is the cause of my problem. Fig. 6 shows two pictures of the same adult.

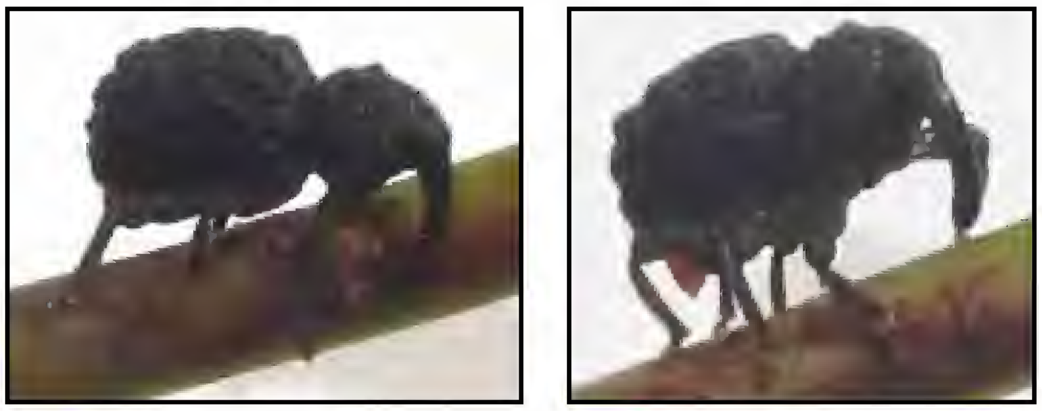

Fig. 6. Australian fern weevil (*Sygarius intrudens*). Adult weevil. I think I disturbed it in the process of laying an egg. More clearly seen in the right hand image

Weevil damage on ferns, mainly polypods

It differs from vine weevil by the deeply pitted upper surface.

In most situations Australian Fern Weevils are unlikely to be a problem. Isolated plants scattered amongst other plants do not seem to be at much risk. However, those of us who are rather obsessed with polypodiums or dense plantings of ferns can end up having problems.

I have sent details of this pest to our one time BPS member in Victoria in Australia, Chris Goudey. He runs Austral Ferns. When he was younger this was a large nursery with the best collection of ferns I have ever seen. Confronted with my facts about Australian Fern Weevil he admitted he`d never heard of it!!! Not surprisingly I was bemused. Chris kindly sent my information on to David Jones, the author of the *Fern Encyclopaedia*, and the authority on such issues in Australia. He was surprised we had this as a problem and in his life he'd only come across it twice in Australia. On neither occasion was it a serious problem. David adds that he thinks natural predators keep it in check in Australia, in this case he thinks it is a wasp. He also comments that somehow the weevil was recorded in Hawaii in 1903 (a year after it was recorded at Glasnevin, Eire) doing a lot of localised damage. I do not know how the Hawaiians overcame the problem.

Control

Five years ago I recommended dusting polypods, and all infested species with creeping rhizomes, with ant powder, as this was certainly easing the situation. I also recommended drenching the crowns of other species with Provado. Neither chemical seems to have any detrimental effect on the ferns.

Drenching polypods with Provado works OK but the chemical does not soak into the plant rhizomes very well – it just diffuses into the soil, dusting with the powder seems more efficient. With the crown forming ferns the situation is reversed, drenching the crown is perfect as the chemical slowly soaks it way down among the leaf bases – where the pest is likely to be hiding. The powder does not penetrate so well. Another advantage with the ant powder is it is cheap and very easy to apply as soon as you see a problem. The Provado is expensive, relatively difficult to obtain, and has to be made up as a drench. I fear it might soon be banned for home gardeners.

Where possible pest avoidance is obviously the best method. Check new acquisitions on arrival for any wilting fronds, after planting continue checking regularly for wilting or detached fronds. With crown forming plants the wilting fronds are usually obvious. As soon as sighted cut the frond off the plant as close as possible to the caudex. Once removed check the rachis to see if there is any obvious damage. Damage might be at the base but could be at any point. If you can find an obvious damage point I recommend splitting the rachis, either with your nails, or more satisfactorily with sharp secateurs. If you find a white grub you`ll know that`s the problem. Kill it! Then drench the crown with Provado and keep a particularly close watch on the plant for more fronds wilting. Remember you have not killed the adult which will presumably lay several eggs.

It seems that it is more difficult to clear the pest from creeping species. Again check for wilting or detached fronds. Check the frond base of these fronds for puncture marks and split the rachis to check for a larva – very rarely you can get more than one. Kill the larva! If you cannot easily check for the larva make sure the suspect frond is removed to a bonfire or waste disposal point. I have found lovely fat larvae in detached fronds at all times of the year, just leaving it laying around may well end up in the pest hatching out successfully. For this reason it is a good idea to remove all fronds in early summer just before the new ones appear. Don`t do this with shears, do them individually with finger and thumb or secateurs, as with shears you will tend to cut above the larva`s eating zone.

Conclusion

I sincerely hope that you do not have a problem with this pest. Unfortunately I know members who have suffered worse than me. At least if you do discover it you can get on top of it using the techniques outlined here. Catch it early and you have a much better chance of eradicating it. I still have the problem in my garden. About 5 years ago everything looked sick but now, while not perfect, it is no longer an acute embarrassment to me and I can once again enjoy my ferns! ❐

Shopping Centre Ferns!

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Whilst exploring Truro city centre after the BPS Cornish field meeting in September 2013, the promise of interesting gift shops lured me into The Lemon Street Market. This comprises a range of specialist shops, several cafés and, on the upper level, the Lander Gallery of classic and contemporary art. I was surprised (and delighted!) to see that the atrium was dominated by several large and well grown *Cyathea medullaris*. Above them were suspended huge ghostly figures.

My recent enquiry to the Lander Gallery revealed that the willow and paper figures were actually giant lanterns from the 2012 Truro City of Lights procession, themed Kings and Queens of England. After each year's procession some of the professionally made lanterns replace those from the previous year on display in the gallery.

The ferns have apparently been a feature of the market since it opened in 2003. The three *C. medullaris* and single *C. smithii* were supplied by Trevena Cross Nurseries, Helston, and had been used at Chelsea Flower Show. Viv Hendra told me "they were quite small then – we used to move them to clean the floor! Now they are enormous and we do not move them at all. They have grown steadily and happily. Two [*C. medullaris*] have been repotted and the third, which is upstairs, will soon have a new pot also."

Many thanks to Mr Viv Hendra of The Lander Gallery, Truro, for information about the ferns and the figures.

WELSH FERNS – A BRIEF HISTORY OF THE HANDBOOK

BARRY A. THOMAS

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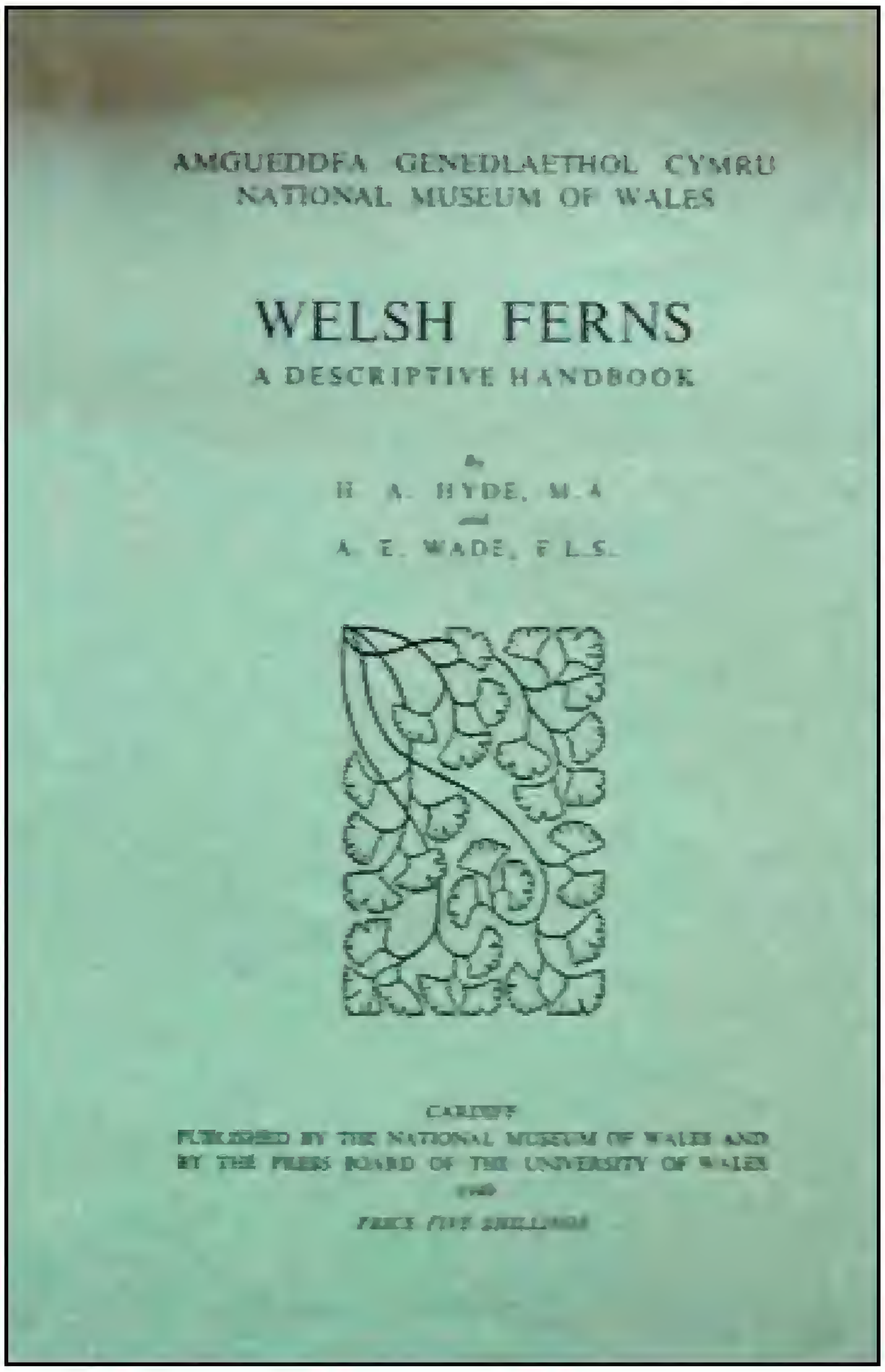
Welsh Ferns first appeared in 1940 written by Harold Augustus Hyde and Arthur E. Wade, who were respectively the Keeper and Assistant Keeper in the Botany Department at the National Museum of Wales, Cardiff. Hyde wrote the Introduction and the various notes on the interrelationships of the families of ferns, while Wade compiled the notes relating to the distribution of the species and the "first records". The species descriptions were written jointly. Most of the line drawings were made by Miss E.A. Jenkins, the Departmental artist, and a few others were reproduced from other publications. The book was designed to be a simple and inexpensive handbook to Welsh ferns aiming to provide beginners with keys and descriptions to identify all the ferns growing wild in Wales. Brief accounts were also given of British ferns not occurring in Wales to give the book wider appeal. Herbarium specimens in the Welsh National Herbarium were listed for each species with details of the collectors (identified in a list towards the end of the book). There was also a bibliography of 55 titles and a combined index and glossary at the back of the book. A useful scale in centimetres and inches was printed on the back cover.

Cardiff: National Museum of Wales and the Press Board of the University of Wales, x, 131 pp. frontispiece, 10 plates, 67 figures, 21.5 x 14 cm. Price five shillings. Cover boards: dark green with black writing and woodcut of Maidenhair Fern.

The second edition was issued in 1948 with the statement of "revised throughout." However, the species descriptions were exactly the same as in the first edition except for the listing of a few more herbarium specimens. The introduction now included a little more information about the geographical significance of the Welsh fern flora. A short "Hints to Collectors" was included.



AMGUEDDFA GENEDLAETHOL CYMRU
NATIONAL MUSEUM OF WALES

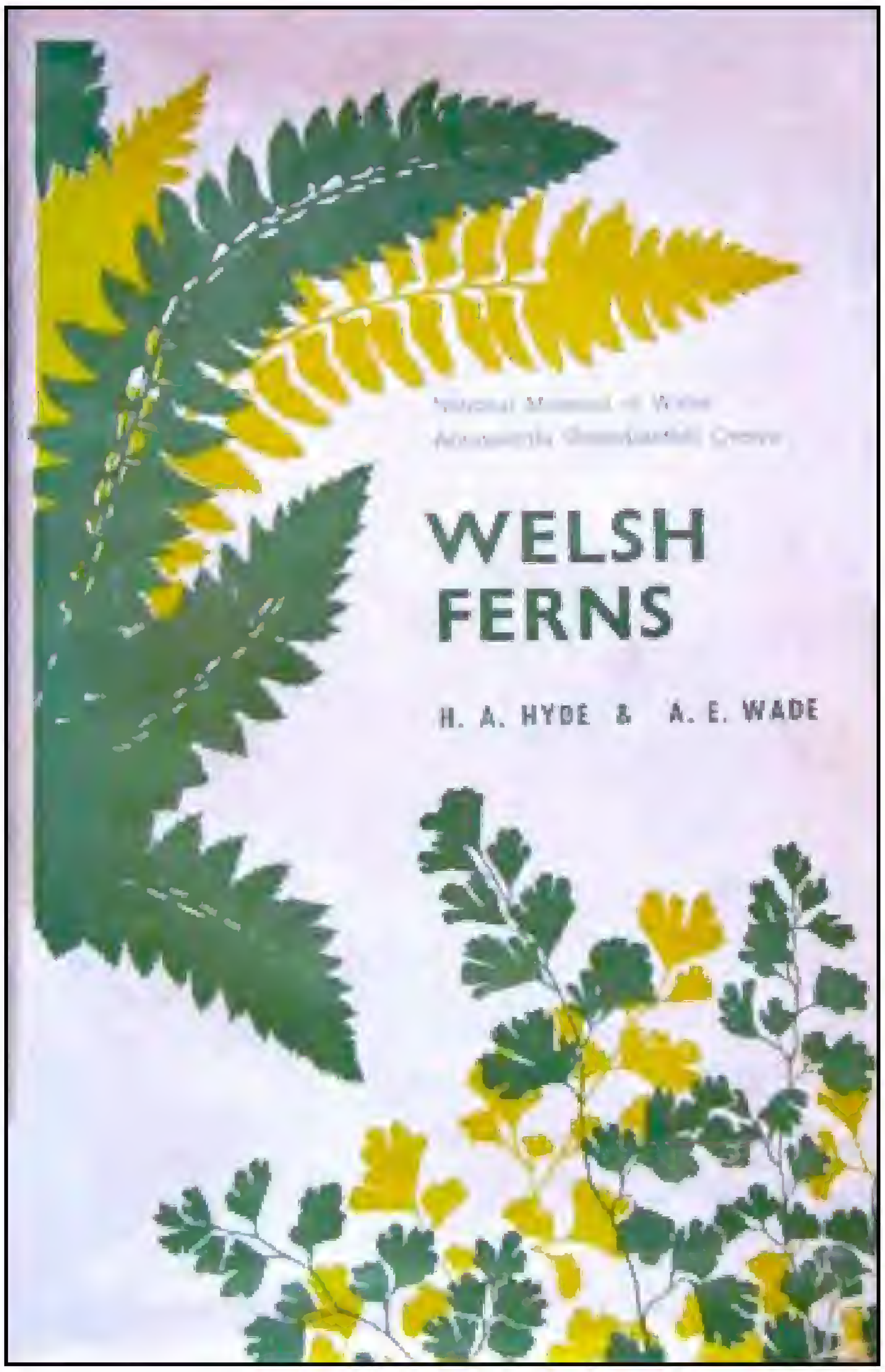
WELSH FERNS
A DESCRIPTIVE HANDBOOK

By
H. A. HYDE, M.A.
and
A. E. WADE, F.L.S.

CARDIFF
PUBLISHED BY THE NATIONAL MUSEUM OF WALES AND
BY THE PRESS BOARD OF THE UNIVERSITY OF WALES
1940
PRICE FIVE SHILLINGS

Fig. 1. The cover of the first edition (1940)

Editions 2 & 3 were similar



WELSH
FERNS

H. A. HYDE & A. E. WADE

Fig. 2. The cover of edition 4 (1962)

WELSH FERNS – A BRIEF HISTORY OF THE HANDBOOK.

Cardiff: National Museum of Wales, x, 131pp. frontispiece, 10 plates, 67 figures, 21.5 x 14 cm. Price five shillings. Cover boards: light green with darker spine, dark green writing and a woodcut of Maidenhair Fern.

The third edition in 1954 had the greater part of the text being lithographed from the Second Edition almost without alteration. The bibliography was increased to 57 titles.

Cardiff: National Museum of Wales, x, 131pp. frontispiece, 10 plates, 67 figures, 21.5 x 14 cm. Price seven shillings and sixpence. Cover boards: light green with darker spine, dark green writing and a woodcut of Maidenhair Fern.

The fourth edition in 1962 had a revised and rearranged text. The conspectus of classification in the first three editions was set in the framework of Christensen's *Filicinae* but in the fourth edition the species were set in the sequence of Dandy's *List of British Vascular Plants*. The varieties of some ferns that had previously been included were omitted, but the descriptions of *Dryopteris* hybrids were increased in number and enlarged to give much more detail. Following the work of Professor Irene Manton the three species of *Polypodium* were included for the first time and chromosome numbers were added to all the species descriptions. The plates were all moved to the end of the text instead of being incorporated within it as had been done previously. This was the first edition to have a dust jacket so the red boards only had the title and authors names on the spine. This necessitated moving the measurement scale onto the first page. There were now 94 collectors in the Index and the bibliography had now increased to 60 titles.

Cardiff: National Museum of Wales, ix, 122pp. 12 plates, 70 figures, 21.5 x 14 cm. Price fifteen shillings. Red boards and white dust cover with light and dark green silhouettes of holly fern and Maidenhair fern.

The fifth edition in 1969 was published under the names of H.A. Hyde, A.E. Wade, and S.G. Harrison. By now both original authors had retired and Sydney George Harrison had become the Keeper of the Botany Department. The scope of the book was enlarged by the inclusion, for the first time, of the Clubmosses, Quillworts and Horsetails and it now had accounts of all the native and naturalised alien pteridophytes in the

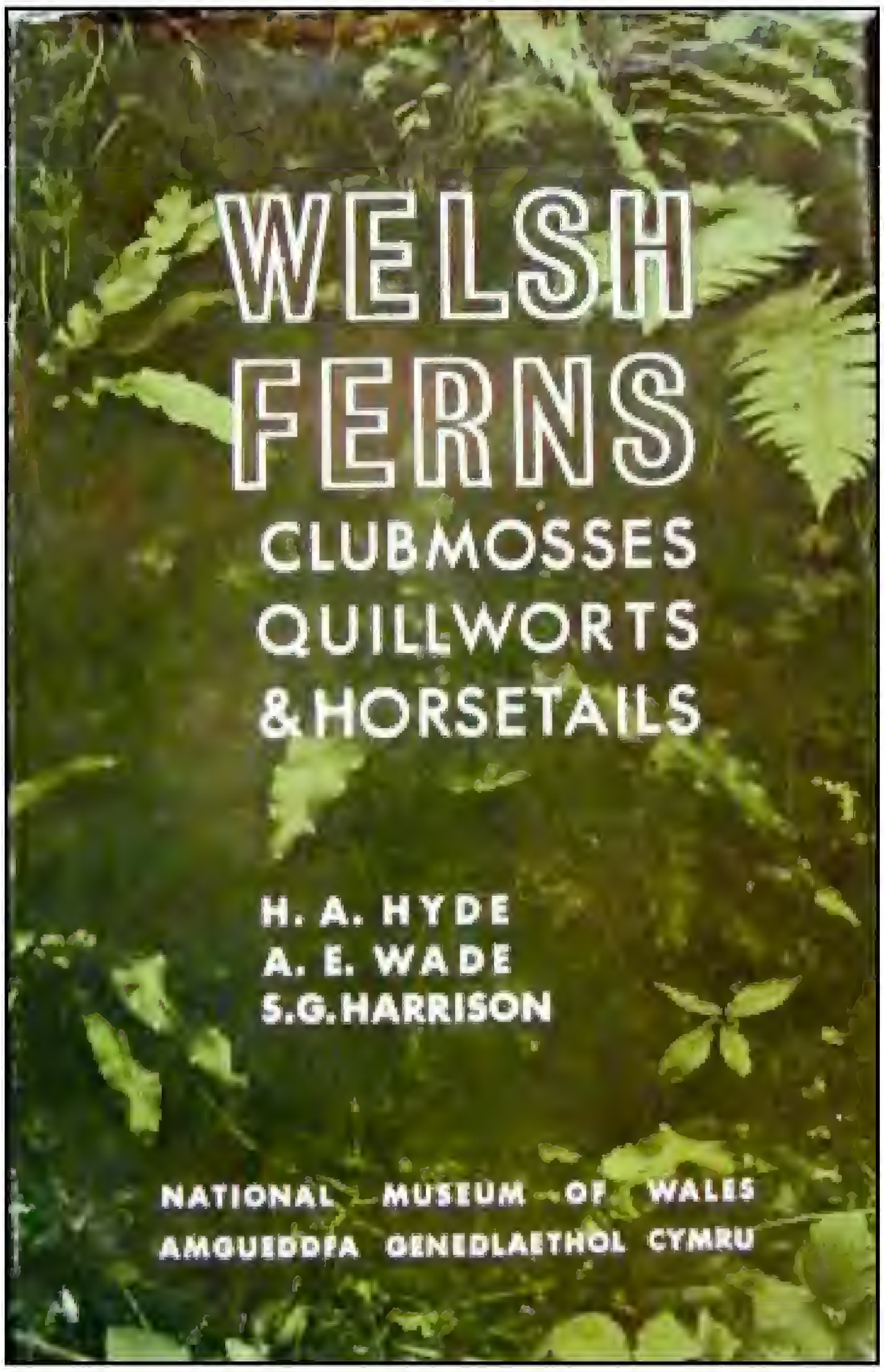


Fig. 3. The cover of edition 5 (1969)

Edition 6 was similar

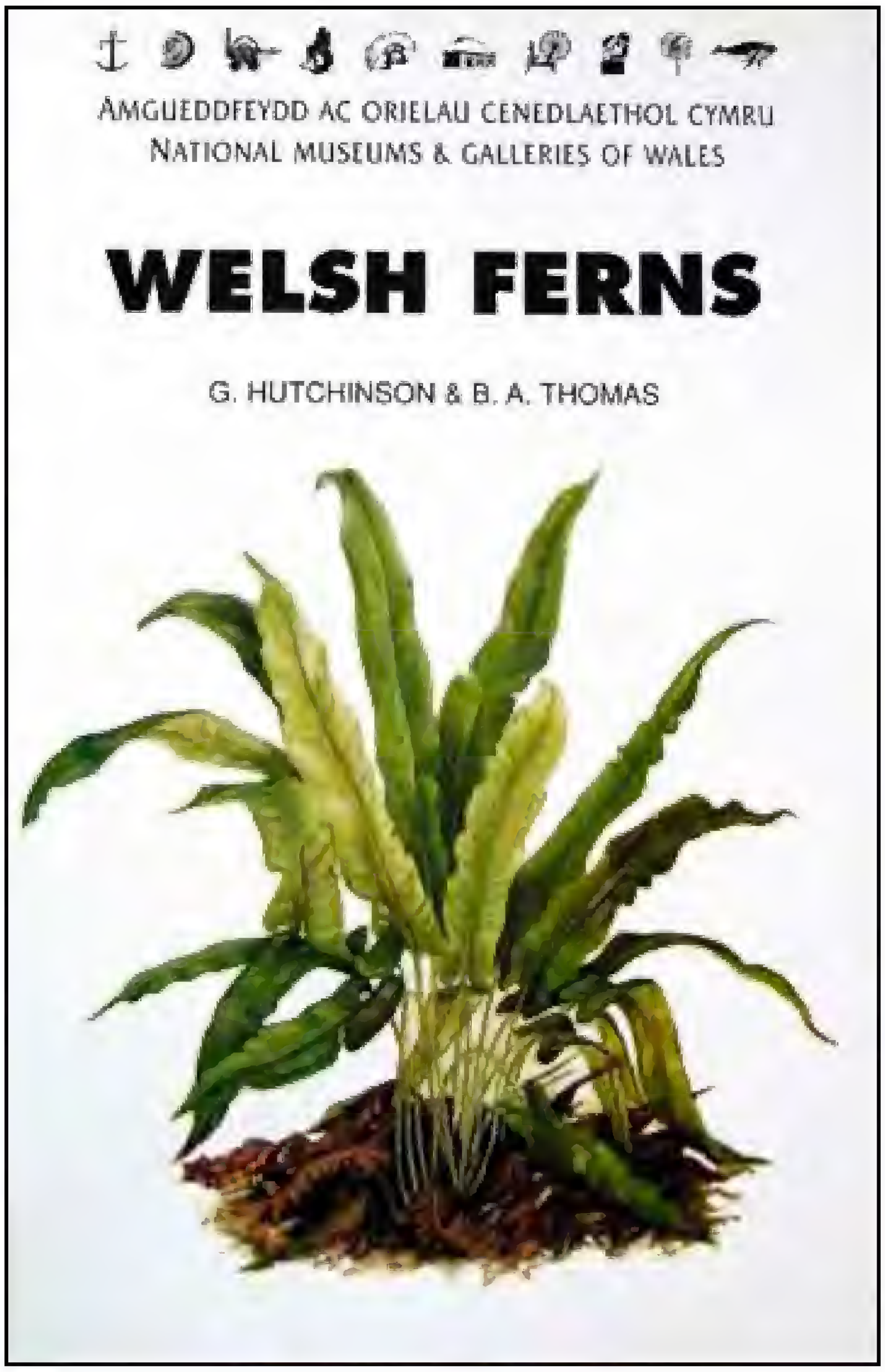

AMGUEDDFEYDD AC ORIELAU CENEDLAETHOL CYMRU
NATIONAL MUSEUMS & GALLERIES OF WALES
WELSH FERNS
G. HUTCHINSON & B. A. THOMAS

Fig. 4. The cover of edition 7 (1996)

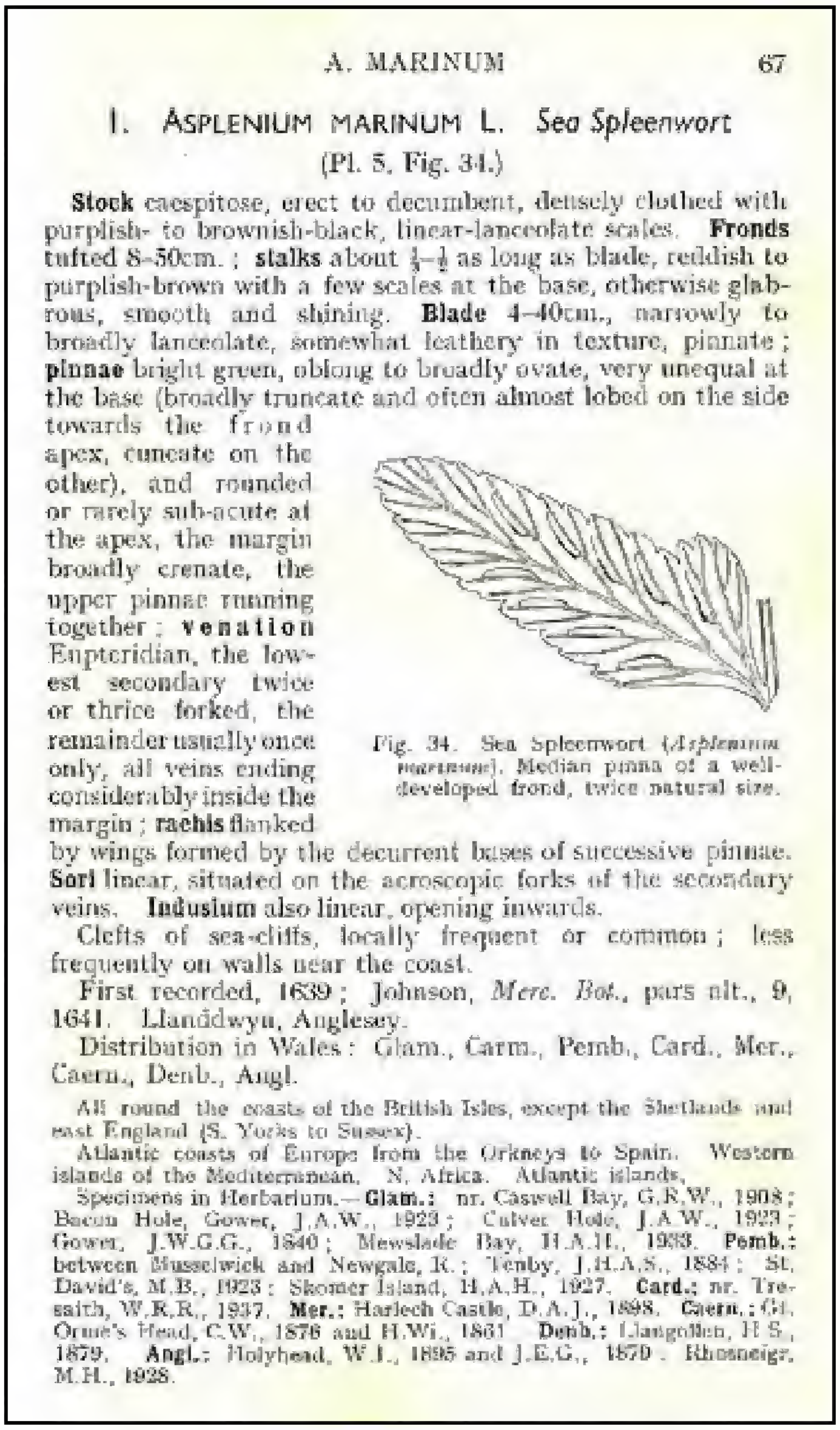
British Isles. The other change was that the order of the genera and species were now based on the system that had been recently adopted in the British Museum Natural History which incorporated Copeland's concept of genera into Pichi-Sermoli's families. One other change was to separate the glossary from the index. The bibliography had increased to 69 titles and a list of periodicals given for the first time. The number of listed herbarium specimens was noticeably increased and the list of collectors had almost doubled to 181. Some of the new illustrations included in this edition had been planned for earlier editions but financial restrictions prevented their inclusion. The plates were now in a different order and included one of single nodes of Horsetails and two, not one, of Welsh Spleenworts.

Cardiff: National Museum of Wales, xii, 178 pp. 14 plates, 85 figures, 21.5 x 14 cm. Price twenty five shillings. Green boards and green dust cover with a photograph of woodland ferns,

The sixth edition in 1978 remained basically unaltered except for taxonomic and nomenclatural changes and the expansion of the descriptions of hybrids. Again the numbers of herbarium specimens were increased and the list of collectors was now approaching 200.

Cardiff: National Museum of Wales, xii, 178 pp. 14 plates, 85 figures, 21.5 x 14 cm. Price £3.00. Lighter green boards and green dust cover with a photograph of woodland ferns, ISBN: 072000210.

The seventh edition in 1996 was published under the names of G. Hutchinson and B.A.Thomas. Harrison had resigned as Keeper and was succeeded by Barry Thomas and George Hutchinson was an assistant curator in the Botany Department. This edition abandoned the previous orders of families and genera and arranged the genera, and species within them, in alphabetical order within the Lycopsida, Sphenopsida and Filicopsida. Specific names were brought up to



A. MARINUM 67

I. ASPLENIUM MARINUM L. *Sea Spleenwort*

(Pl. 5, Fig. 34.)

Stock caespitose, erect to decumbent, densely clothed with purplish- to brownish-black, linear-lanceolate scales. **Fronds** tufted 8–50cm.; **stalks** about ⅓–½ as long as blade, reddish to purplish-brown with a few scales at the base, otherwise glabrous, smooth and shining. **Blade** 4–40cm., narrowly to broadly lanceolate, somewhat leathery in texture, pinnate; **pinnae** bright green, oblong to broadly ovate, very unequal at the base (broadly truncate and often almost lobed on the side towards the frond apex, cuneate on the other), and rounded or rarely sub-acute at the apex, the margin broadly crenate, the upper pinnae running together; **venation** Eupteridian, the lowest secondary twice or thrice forked, the remainder usually once only, all veins ending considerably inside the margin; **rachis** flanked by wings formed by the decurrent bases of successive pinnae. **Sori** linear, situated on the acroscopic forks of the secondary veins. **Indusium** also linear, opening inwards.

Fig. 34. Sea Spleenwort (*Asplenium marinum*). Median pinna of a well-developed frond, twice natural size.

Clefts of sea-cliffs, locally frequent or common; less frequently on walls near the coast.

First recorded, 1639; Johnson, *Merc. Bot.*, pars alt., 9, 1641. Llanddwyn, Anglesey.

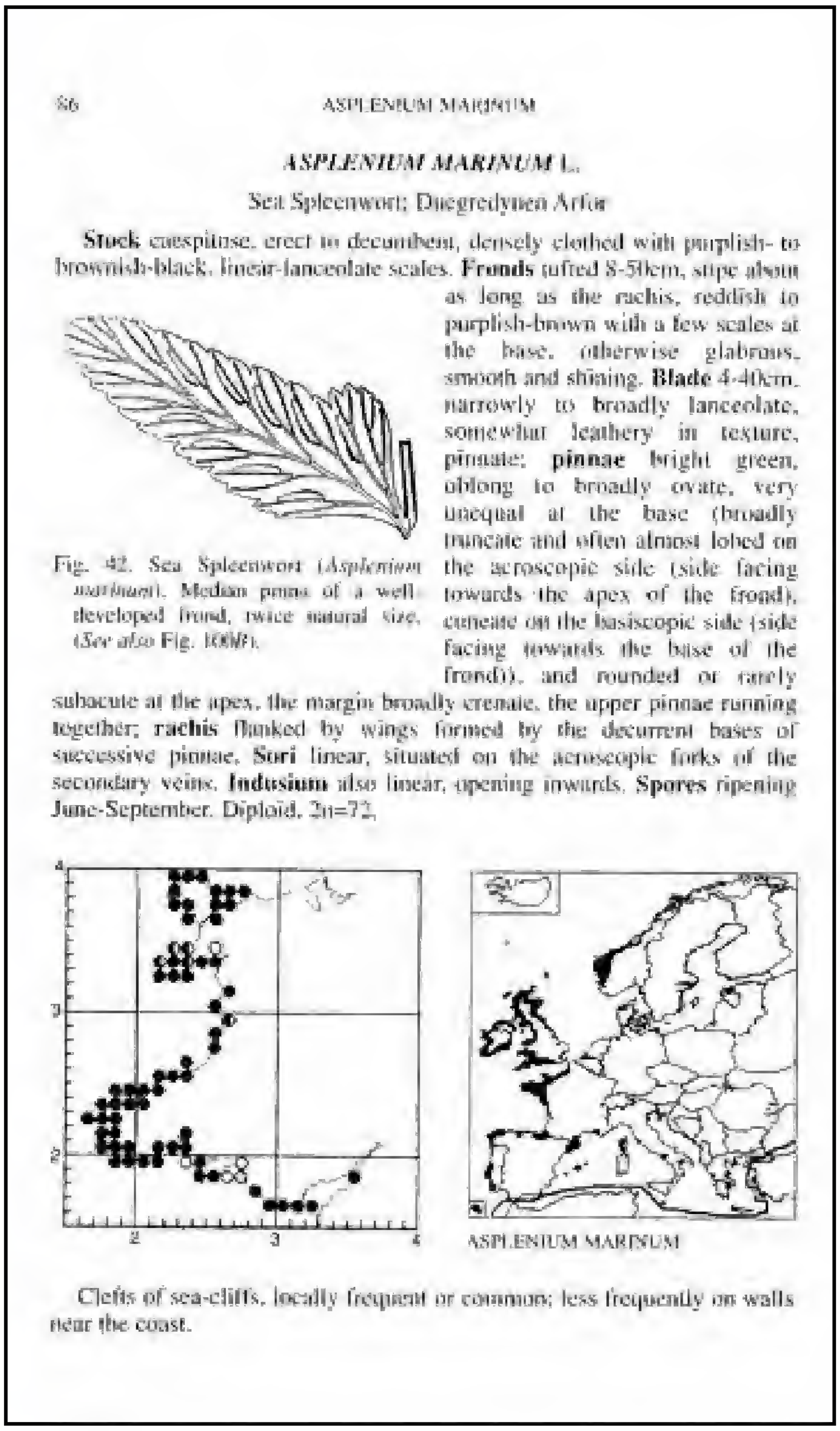
Distribution in Wales: Glam., Carm., Pemb., Card., Mer., Caern., Denb., Angl.

All round the coasts of the British Isles, except the Shetlands and east England (S. Yorks to Sussex).

Atlantic coasts of Europe from the Orkneys to Spain. Western islands of the Mediterranean. N. Africa. Atlantic islands.

Specimens in Herbarium.—**Glam.:** nr. Caswell Bay, G.R.W., 1908; Bacon Hole, Gower, J.A.W., 1923; Culver Hole, J.A.W., 1923; Gower, J.W.G.G., 1840; Mewslade Bay, H.A.H., 1933. **Pemb.:** between Musselwick and Newgale, R.; Tenby, J.H.A.S., 1884; St. David's, M.B., 1923; Skomer Island, H.A.H., 1927. **Card.:** nr. Tresaith, W.R.R., 1937. **Mer.:** Harlech Castle, D.A.J., 1898. **Caern.:** Gt. Orme's Head, C.W., 1876 and H.Wi., 1861. **Denb.:** Llangollen, H.S., 1879. **Angl.:** Holyhead, W.I., 1895 and J.E.G., 1870. Rhosneigr, M.H., 1928.

Fig. 5. The entry for *Asplenium marinum* in the first edition of 1940 showing the description, habitat, first record in Wales, County distribution, distribution in the British Isles, and specimens in the herbarium together with information on County, locality, collector and date collected



86 ASPLENIUM MARINUM

***ASPLENIUM MARINUM* L.**

Sea Spleenwort; Duegredynen Arfor

Stock caespitose, erect to decumbent, densely clothed with purplish- to brownish-black, linear-lanceolate scales. **Fronds** tufted 8-50cm, stipe about as long as the rachis, reddish to purplish-brown with a few scales at the base, otherwise glabrous, smooth and shining. **Blade** 4-40cm, narrowly to broadly lanceolate, somewhat leathery in texture, pinnate; **pinnae** bright green, oblong to broadly ovate, very unequal at the base (broadly truncate and often almost lobed on the acroscopic side (side facing towards the apex of the frond), cuneate on the basiscopic side (side facing towards the base of the frond)), and rounded or rarely subacute at the apex, the margin broadly crenate, the upper pinnae running together; **rachis** flanked by wings formed by the decurrent bases of successive pinnae. **Sori** linear, situated on the acroscopic forks of the secondary veins. **Indusium** also linear, opening inwards. **Spores** ripening June-September. Diploid, 2n=72.

Fig. 42. Sea Spleenwort (*Asplenium marinum*). Median pinna of a well-developed frond, twice natural size. (*See also* Fig. 100B).

Clefts of sea-cliffs, locally frequent or common; less frequently on walls near the coast.

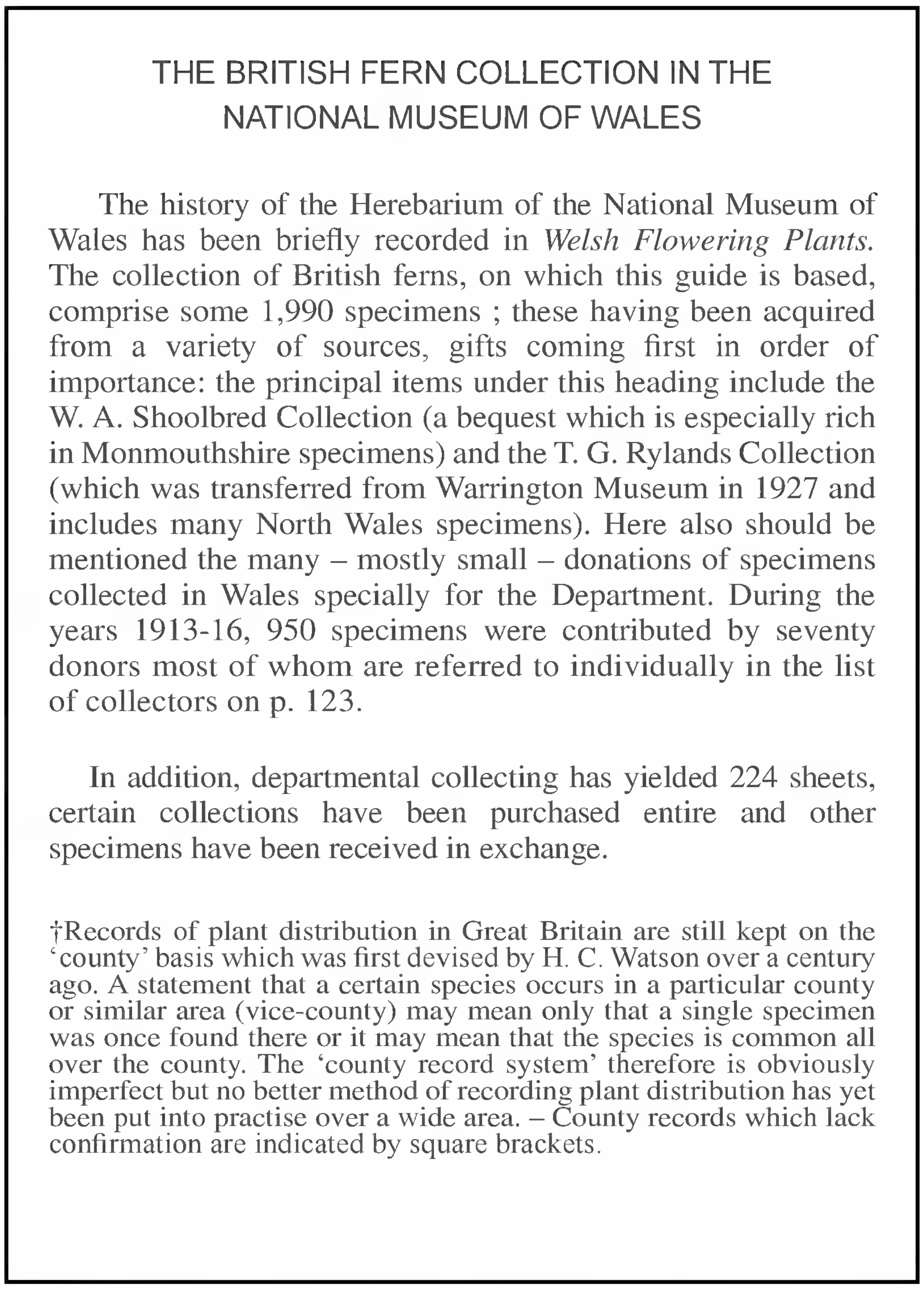
Fig. 6. The entry for *Asplenium marinum* in the 7th edition of 1966 showing the description, habitat, Welsh distribution and distribution in the British Isles and Europe using hectad maps. The following page gives details of the first recording in Wales and also describes the distribution

date and the subspecies of *Dryopteris affinis* described together with their soral structures that were illustrated for the first time in *Welsh Ferns*. Aliens were included within the alphabetical ordering. Welsh name were given for the first time. Additional information and diagrams were included to explain the divisions of the fronds and the shapes and outlines of the ultimate segments as a further aid for identification. The lists of herbarium specimens and the list of collectors were omitted because the increasing numbers made the continuation of these impractical. Instead 10 km square (hectad) maps were included to show the distribution of all, but the rarest species in Wales. Their distributions in Europe were shown by outline maps. The glossary was enlarged with over 100 additional entries including new geographical terms with many of the original entries expanded. The lack of a dust cover permitted the measuring scale to be printed on the inside of the front cover.

Cardiff: Department of Botany, National Museum & Galleries of Wales, iii, 265 pp. 115 figures, 21 x 14.7 cm. Price £11. White soft cover with a painting of Asplenium scolopendrium by Dale Evans, ISBN: 0720004357.

The various authors have from the very beginning attempted to give up-to-date information in a readable, useful and affordable manner to further both professional and amateur interest in pteridophytes. Each edition seems to have been well received. For example Clive Jermy, in reviewing the fifth edition in the *Fern Gazette* (10, 2, p.103, 1969) wrote "Welsh Ferns has long been regarded as the British pteridologist's 'Bible.' This edition ... is even more so and it is the one we have been waiting for. … I hope there will be few schools or public libraries without it." Professor A.R. Clapham wrote about the 6th edition for the *New Phytologist* (83, 1, p.293, 1979) "The present 6th edition retains the virtues of the earlier editions. … It is much to be hoped that this attractive and valuable book will remain available for at least another forty years and further revisions will be undertaken as they become desirable." George Yatskievych of the Missouri Botanical Garden, reviewed the 7th edition for the *American Fern Journal* (87, 3, p.116, 1979) and wrote "The 7th edition brings the treatment to new levels of detail and usefulness. … although the book has a superficial resemblance to earlier editions, the contents have been improved substantially. … As an affordable guide to a beautiful and naturally diverse portion of the British Isles, this title is recommended to both amateur and professional botanists."

It is hoped that *Welsh Ferns* will continue to be supported by the National Museum of Wales. The seventh edition is still available but the eighth edition is already being planned to have the latest taxonomic updates and for the first time colour photographs. ❒



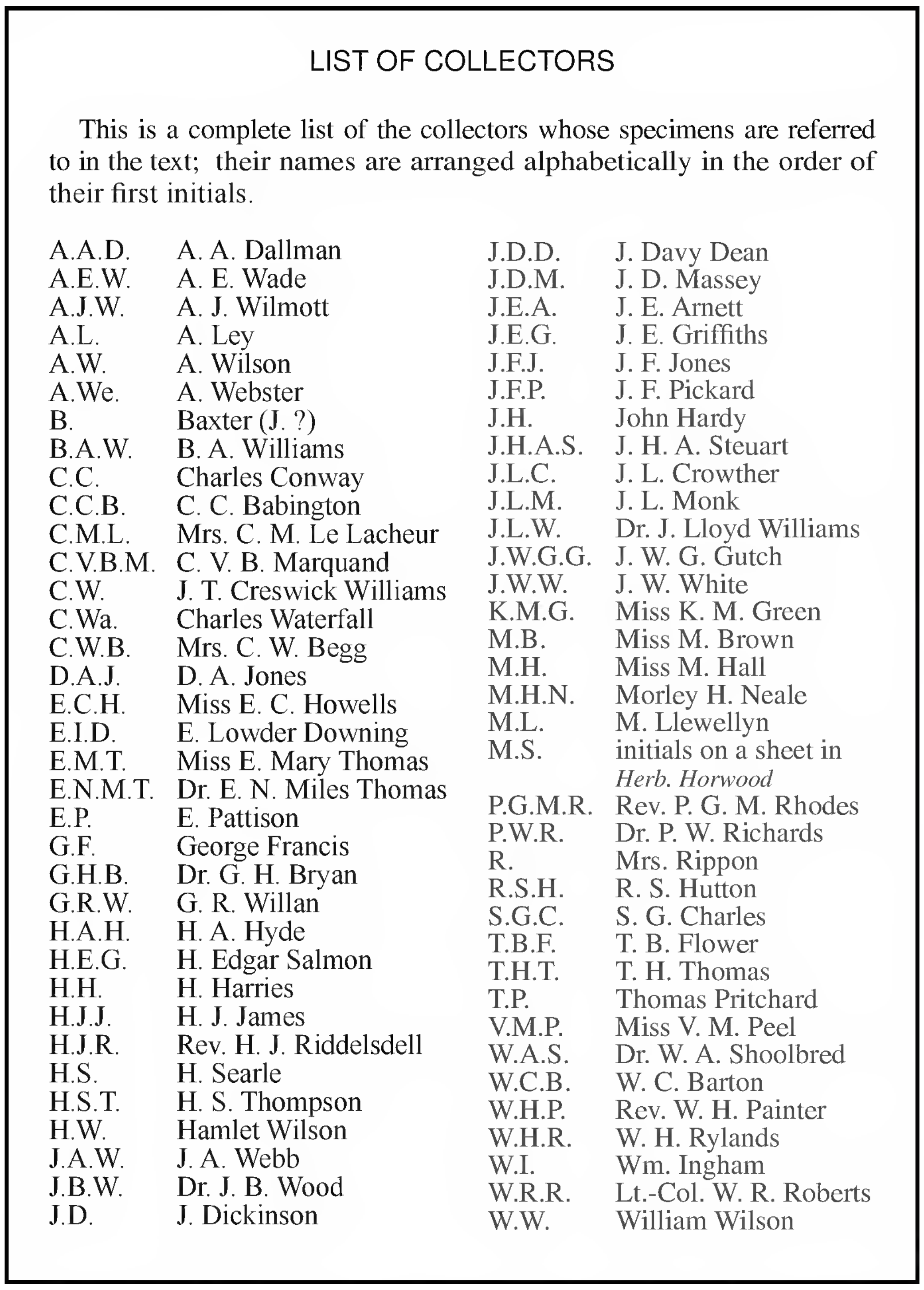
THE BRITISH FERN COLLECTION IN THE NATIONAL MUSEUM OF WALES

The history of the Herebarium of the National Museum of Wales has been briefly recorded in *Welsh Flowering Plants*. The collection of British ferns, on which this guide is based, comprise some 1,990 specimens ; these having been acquired from a variety of sources, gifts coming first in order of importance: the principal items under this heading include the W. A. Shoolbred Collection (a bequest which is especially rich in Monmouthshire specimens) and the T. G. Rylands Collection (which was transferred from Warrington Museum in 1927 and includes many North Wales specimens). Here also should be mentioned the many – mostly small – donations of specimens collected in Wales specially for the Department. During the years 1913-16, 950 specimens were contributed by seventy donors most of whom are referred to individually in the list of collectors on p. 123.

In addition, departmental collecting has yielded 224 sheets, certain collections have been purchased entire and other specimens have been received in exchange.

†Records of plant distribution in Great Britain are still kept on the 'county' basis which was first devised by H. C. Watson over a century ago. A statement that a certain species occurs in a particular county or similar area (vice-county) may mean only that a single specimen was once found there or it may mean that the species is common all over the county. The 'county record system' therefore is obviously imperfect but no better method of recording plant distribution has yet been put into practise over a wide area. – County records which lack confirmation are indicated by square brackets.

Fig. 7. Notes on the British Fern Collection in the National Museum of Wales in the First Edition of 1940

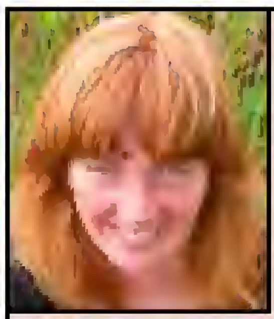


LIST OF COLLECTORS

This is a complete list of the collectors whose specimens are referred to in the text; their names are arranged alphabetically in the order of their first initials.

A.A.D.	A. A. Dallman
A.E.W.	A. E. Wade
A.J.W.	A. J. Wilmott
A.L.	A. Ley
A.W.	A. Wilson
A.We.	A. Webster
B.	Baxter (J. ?)
B.A.W.	B. A. Williams
C.C.	Charles Conway
C.C.B.	C. C. Babington
C.M.L.	Mrs. C. M. Le Lacheur
C.V.B.M.	C. V. B. Marquand
C.W.	J. T. Creswick Williams
C.Wa.	Charles Waterfall
C.W.B.	Mrs. C. W. Begg
D.A.J.	D. A. Jones
E.C.H.	Miss E. C. Howells
E.I.D.	E. Lowder Downing
E.M.T.	Miss E. Mary Thomas
E.N.M.T.	Dr. E. N. Miles Thomas
E.P.	E. Pattison
G.F.	George Francis
G.H.B.	Dr. G. H. Bryan
G.R.W.	G. R. Willan
H.A.H.	H. A. Hyde
H.E.G.	H. Edgar Salmon
H.H.	H. Harries
H.J.J.	H. J. James
H.J.R.	Rev. H. J. Riddelsdell
H.S.	H. Searle
H.S.T.	H. S. Thompson
H.W.	Hamlet Wilson
J.A.W.	J. A. Webb
J.B.W.	Dr. J. B. Wood
J.D.	J. Dickinson
J.D.D.	J. Davy Dean
J.D.M.	J. D. Massey
J.E.A.	J. E. Arnett
J.E.G.	J. E. Griffiths
J.F.J.	J. F. Jones
J.F.P.	J. F. Pickard
J.H.	John Hardy
J.H.A.S.	J. H. A. Steuart
J.L.C.	J. L. Crowther
J.L.M.	J. L. Monk
J.L.W.	Dr. J. Lloyd Williams
J.W.G.G.	J. W. G. Gutch
J.W.W.	J. W. White
K.M.G.	Miss K. M. Green
M.B.	Miss M. Brown
M.H.	Miss M. Hall
M.H.N.	Morley H. Neale
M.L.	M. Llewellyn
M.S.	initials on a sheet in *Herb. Horwood*
P.G.M.R.	Rev. P. G. M. Rhodes
P.W.R.	Dr. P. W. Richards
R.	Mrs. Rippon
R.S.H.	R. S. Hutton
S.G.C.	S. G. Charles
T.B.F.	T. B. Flower
T.H.T.	T. H. Thomas
T.P.	Thomas Pritchard
V.M.P.	Miss V. M. Peel
W.A.S.	Dr. W. A. Shoolbred
W.C.B.	W. C. Barton
W.H.P.	Rev. W. H. Painter
W.H.R.	W. H. Rylands
W.I.	Wm. Ingham
W.R.R.	Lt.-Col. W. R. Roberts
W.W.	William Wilson

Fig. 8. The list of collectors referred to in Fig. 7 in the First Edition of 1940



Dryopteris remota (A. Braun ex Döll) Druce: a new species in the English flora

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Dryopteris remota (Scaly Buckler-fern) is distributed through upland central Europe from northern Spain to the Caucasus. Populations are small and isolated, the species being most abundant in Switzerland, southern Germany and Austria (Schneller *et al.*, 1998). *Dryopteris remota* is a triploid species of hybrid derivation, the result of a cross between the diploid taxa *D. affinis* (Golden-scaled Male-fern) and *D. expansa* (Northern Buckler-fern). From *D. affinis* it inherits an apogamous lifestyle and is thus capable of reproducing new sporophytic plants from single spores. An investigation of genetic variation between geographically separated populations suggests that this species arose from a single hybridisation event and has subsequently spread by long-distance dispersal, with mutations responsible for any genetic variation, rather than having had multiple hybrid origins (Schneller *et al.*, 1998).

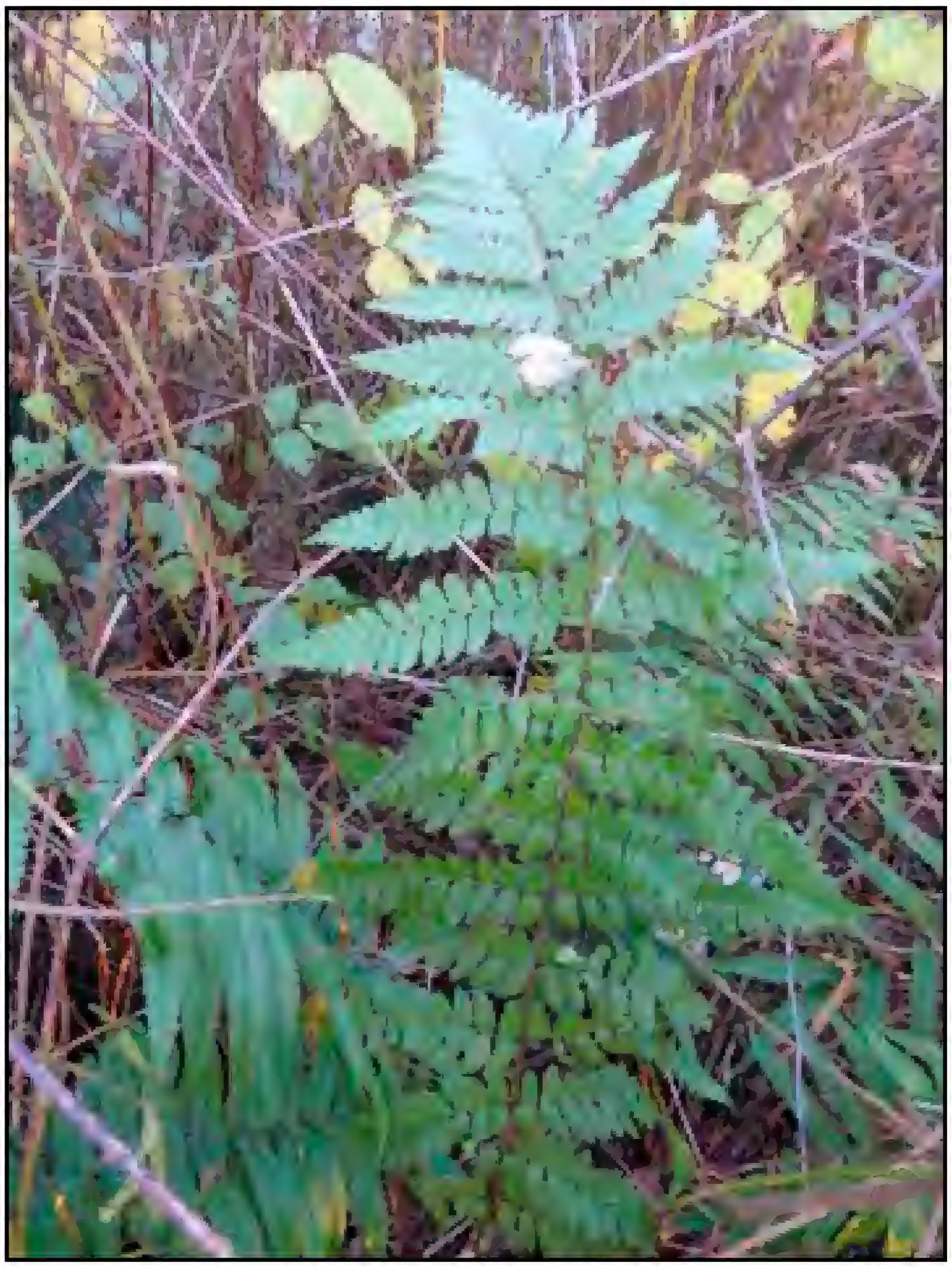

Fig. 1. *Dryopteris remota* near Wells, Somerset

Dryopteris remota has been amongst the most enigmatic of British and Irish ferns; it is also one of only a few which are believed to have become extinct in historical times. In the late nineteenth century it was discovered in Scotland and then, shortly afterwards, in Ireland, although its identity was not understood until the pioneering cytological studies of Irene Manton (Manton, 1950). The first find was made in 1894 by W.B. Boyd, between Ardlui and Tarbet, near the west shore of Loch Lomond (Page, 1997); in Ireland R.L. Praeger found one small clump in 1898, beside the stream in woods at Dalystown, on the eastern slope of Slieve Aughty, in southeast Galway (Praeger, 1909). From the one small clump, Praeger took away a root to grow; it is possible that in Scotland there was also only a single specimen which may have been removed for cultivation. The species was never re-found at these sites and indeed *D. remota* has not hitherto been rediscovered in the wild in Britain or Ireland. Material from both sites, however, persisted in cultivation for many years (Manton, 1950) and offspring may perhaps still survive. Indeed we would be keen to hear whether any members have material of definite British or Irish provenance.

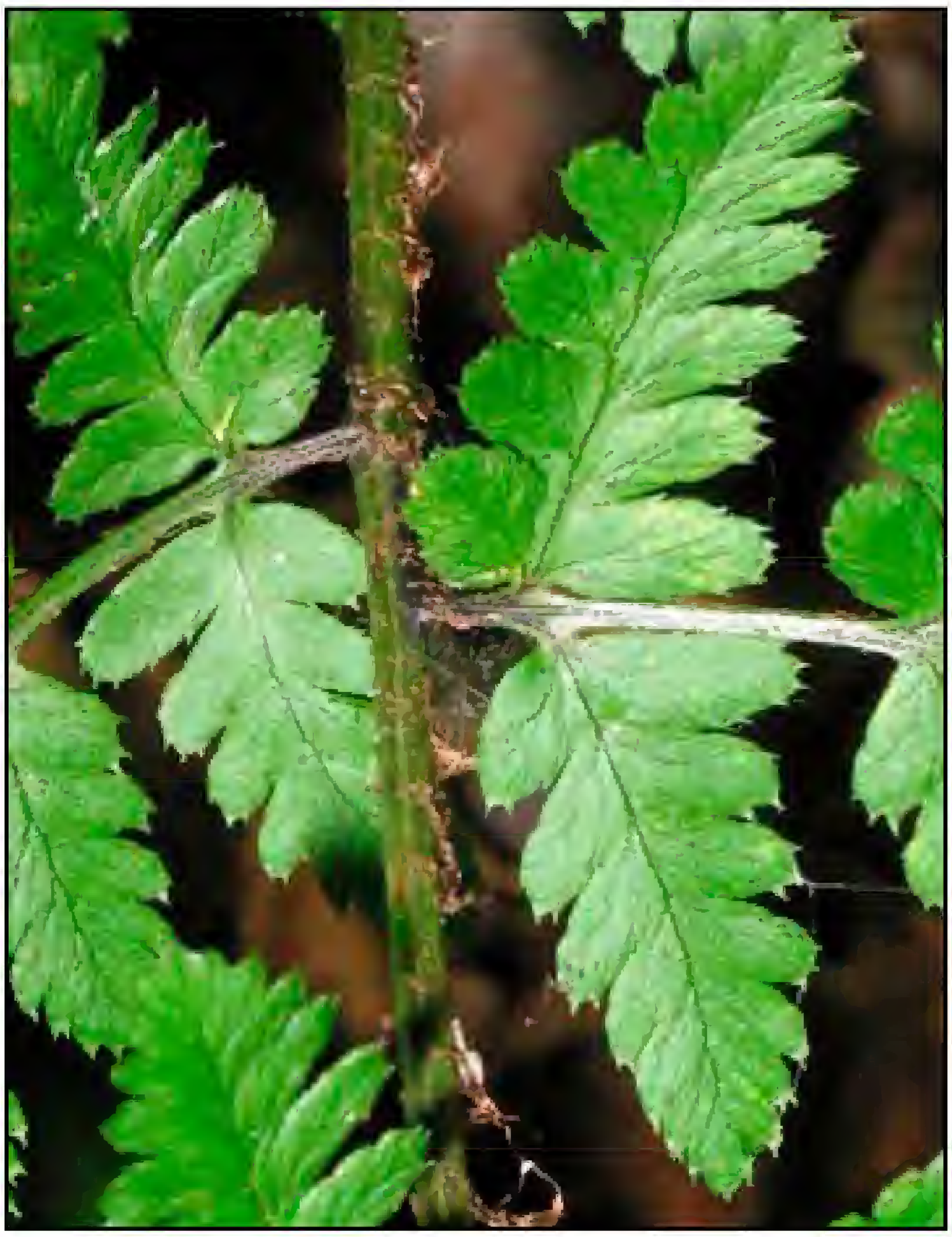

Fig. 2. Details of pinnae of *Dryopteris remota*

There has long been debate regarding the status and origin of these British and Irish plants. The continued treatment of the plant as a hybrid (eg by Page, 1997), rather than a species of hybrid origin, may imply that the plants arose *de novo* at these isolated sites. Since *D. expansa* has never been found in Ireland, however, the appearance of *D. remota* in a natural site there is best explained as the result of long-distance spore dispersal. In the area of the Scottish record, both parents co-exist; a local genesis cannot therefore be ruled out, although the work of Schneller *et al.* (1998) would suggest that this is unlikely. In both Scotland and Ireland *D. remota* has been considered to be a native, having arrived without the intervention of Man.

Whilst botanising around Dulcote, near Wells in Somerset in December 2014, the authors were surprised and delighted to find a large plant of *Dryopteris cycadina* (Shaggy Shield-fern) growing in a dense thicket of spiny vegetation on the embankment of the A371, remote from habitation, although beside a cycle path. The plant had about ten fronds, each *c.*90cm long, and was situated behind a stout wooden and wired fence. About 10m along the track, we discovered a single plant of *Dryopteris erythrosora* (Japanese Shield-fern), also growing in a dense patch of spiny scrub, although this plant was outside the fence. There were no other naturalised garden plants nearby and neither fern appeared to have been planted; indeed the thorny scrub would have made this extremely difficult. Although there was litter in the hedgerow, there was no evidence of fly-tipping of garden waste. *D. cycadina* and *D. erythrosora* are both Asiatic species, stocked by many garden centres. Both have been given the Award of Garden Merit by the Royal Horticultural Society and have become more widely available in recent years. Our records of these two species were the first for Somerset, but there are a few records from elsewhere, demonstrating that both species have escaped cultivation before. Both are apomictic, capable of producing new sporophytes in the absence of fertilisation, a breeding system which confers upon them a reproductive advantage since new plants can be produced from a single spore and there is no dependency on water for gamete motility. A number of successful alien fern colonists adopt this strategy (Crouch & Rumsey, 2010).

Astonishingly, a single plant of *Dryopteris remota* with four fronds (Fig.1) was found to be growing in very close association with the *Dryopteris cycadina* plant. Unlike the other two species, *D. remota* is less frequently seen for sale or cultivated, although it is available from specialist nurseries and doubtless many readers will have it in their collections. The authors both grow this species and FJR finds that it recruits regularly into nearby pots, a feature also commented upon by Hoshizaki & Moran (2001). It is possible that the *D. cycadina* had at some stage been cast out bare-rooted, with a juvenile *D. remota* self-sown on the root ball. The spiny vegetation behind a fence hampered close investigation. Alternatively, perhaps both species have arisen from spores borne on discarded fronds. It seems utterly improbable that they arrived at the same spot by long-distance spore dispersal, even if dispersal was only from the nearest fern-lover's garden.

Dryopteris remota is a handsome fern. At a superficial glance it resembles our commoner native Buckler-ferns: in colour like *D. dilatata* and in 'prickliness' of the pinnules and the narrow rather erect fronds like *D. carthusiana*. It differs from both in having a lesser degree of frond dissection (2-pinnate-pinnatifid not 3-pinnate), whilst at the base of each pinna the rachis has the bluish-black staining typical of *D. affinis*, a character retained to some degree in all the hybrid offspring of *D. affinis* and usually very marked in *D. remota* (Fig.2).

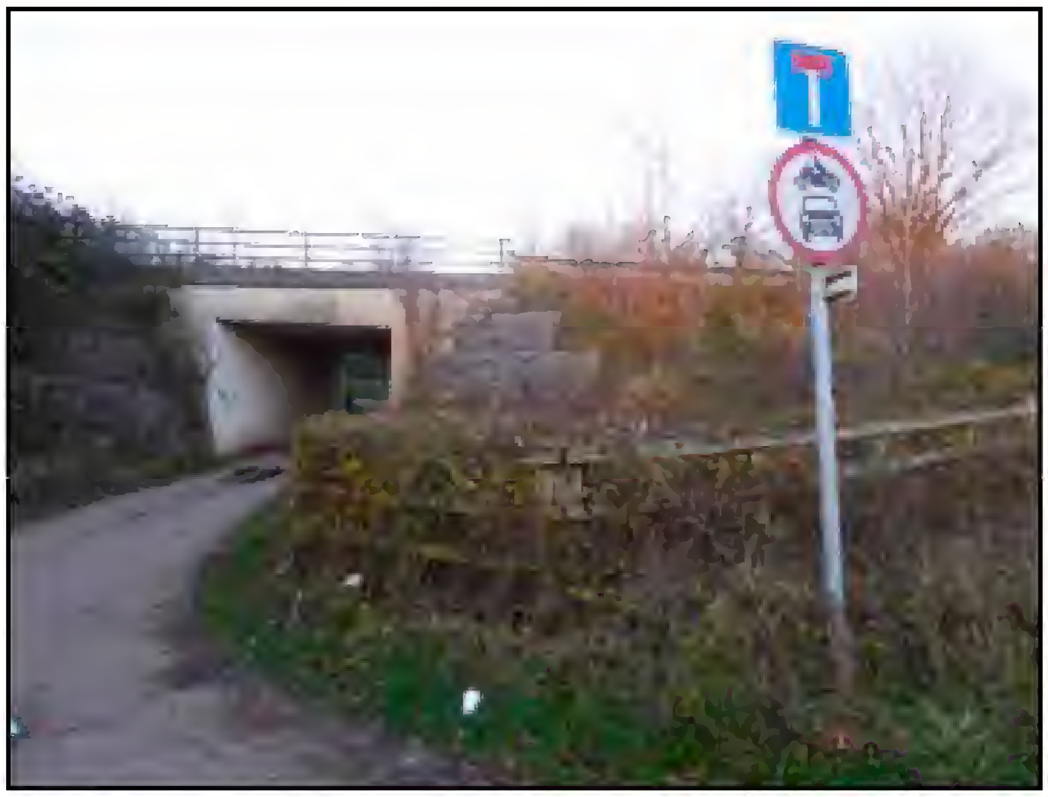

Fig. 3. Site of *Dryopteris cycadina* and *D. remota* near Wells, Somerset. Both were growing in scrub behind the fence, near its corner. *D. erythrosora* was around the bend, before the bridge

The reappearance of *D. remota* in Britain was considered a possibility by Edgington (2013). Despite the relatively natural setting of the Somerset plant of *D. remota* (Fig.3), its close association with two alien Asiatic species of *Dryopteris* strongly suggests a garden origin; the first record of this species in England must thus be considered to be of alien status. Escape from cultivation will perhaps always be a more likely route of arrival of *D. remota* at new sites in Britain and Ireland than long-distance spore dispersal from its native continental range. ❒

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Polystichum x arendsii. A first record for the British Isles

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About 25 to 30 years ago I wrote to Dr Fisher, a member of the BPS living near Bromyard, asking if I could visit his garden with a view to looking particularly at his ferns. Reginald Kaye had told me he had bought good things over the years and there was always the possibility of finding a cultivar he`d bought from Reg that had subsequently been lost on the nursery. Unfortunately Dr Fisher was getting very old and he put me off as he felt his garden was way past its best and did not think it worth visiting.

There the subject rested until a year or two later Dr Fisher died and his son found my letter and contacted me inviting me to see the garden now in an overgrown state. Of course I was delighted to accept the invitation. The house was going to put up for sale and I was invited to take any plants I thought worth saving. Furthermore the son welcomed the idea of the Committee of the Hereford Group of the NCCPG exploring the garden for plants worth saving.

I subsequently met the new owners, circa 1994, but they were not keen gardeners. That was where the subject rested until Roger and Sue Norman asked me if I would like to join them in surveying a garden near Bromyard for any interesting plants that should be conserved. I guessed it would be the Fisher garden, and I was right, but it is always exciting to explore old gardens so I jumped at the chance.

The property had recently changed hands and the new owners decided it would be good to check what they had before they started any wholesale clearing. The garden had not deteriorated since 1994, but very little work other than tidying seemed to have taken place. Quite a few ferns persisted, but they were all fairly predictable until we reached the bottom of the garden where a very large fern was winning the fight against rampant weeds on the bank above a brook (Fig.1).

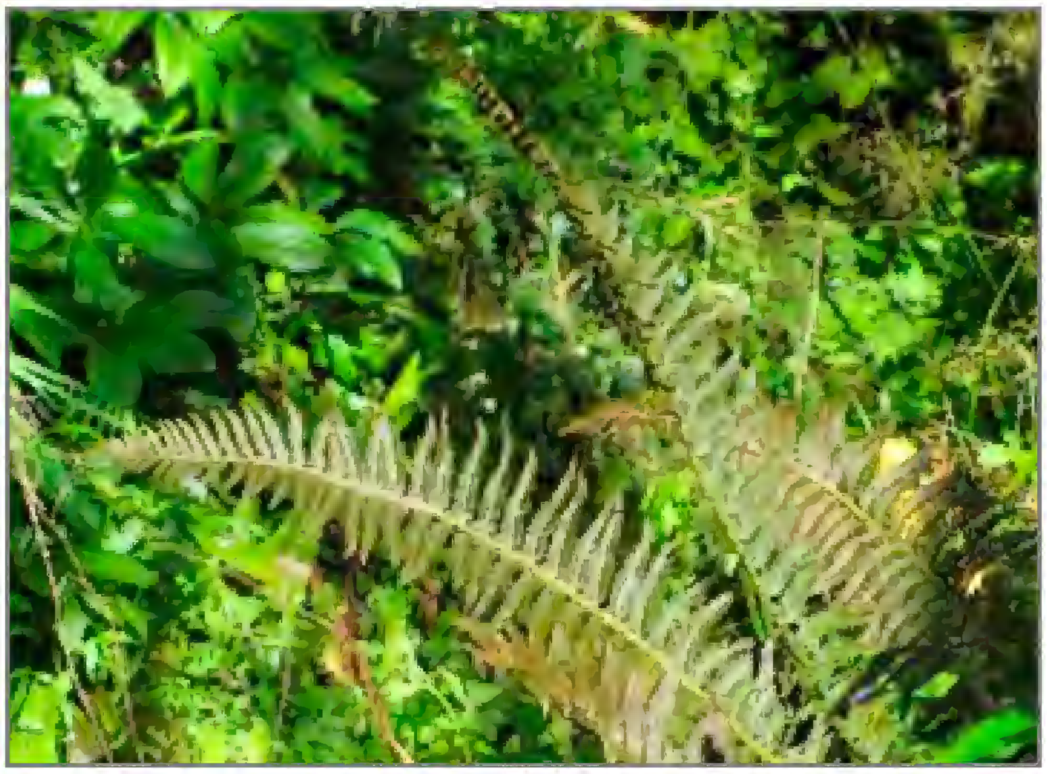

Fig. 1. Large unknown polystichum growing among the rampant vegetation by the brook in the Bromyard garden

None of us knew what it was except it was a polystichum. After a couple of minutes I decided it had to be hybrid but it was not the same as anything I`d seen before. It reminded me of the Madeiran hybrid, *P. maderense* (*P. falcinellum* x *P. setiferum*), or *P.* x *lesliei* (*P. munitum* x *P. setiferum*) which Alan Leslie and Patrick Acock had both found recently several hundreds of miles apart quite independently for the equal first time in Britain (see *The Fern Gazette*, Vol.16,pp.245 – 251.). After some exchange of emails with Patrick, *P.* x *lesliei* was favourite, as *P. munitum* and *P. setiferum* grew nearby. Comparing with *P.* x *lesliei* fronds it did not , however, look quite right. Could it be a hybrid with *P. aculeatum*? It looked morphologically a good candidate, but there were no plants nearby in the garden. Later, however, the new garden owner found Dr Fisher`s book of the garden in its heyday and he did have 5 plants of *P. aculeatum*. Strange they have all died out, it is not a rare plant locally.

Patrick forwarded my photos of the fern to Rolf Theimann in Germany, he immediately sent back confirmation that the plant is *P. munitum* x *P. aculeatum* or *P.* x *arendsii*. Regrettably I had overlooked Rolf`s article in the previous *Pteridologist* Vol. 5 p.391-392 with a perfect pictures of *P.* x *arendsii*! Rolf has raised it artificially in Germany. In the article he tells us *P.* x *arendsii* was first described by Christ in 1906. It was named after Georg Arends, a gardener, who presumably raised the first plants. Neither Rolf nor I know of any record for this hybrid occurring in Britain (Fig.2).

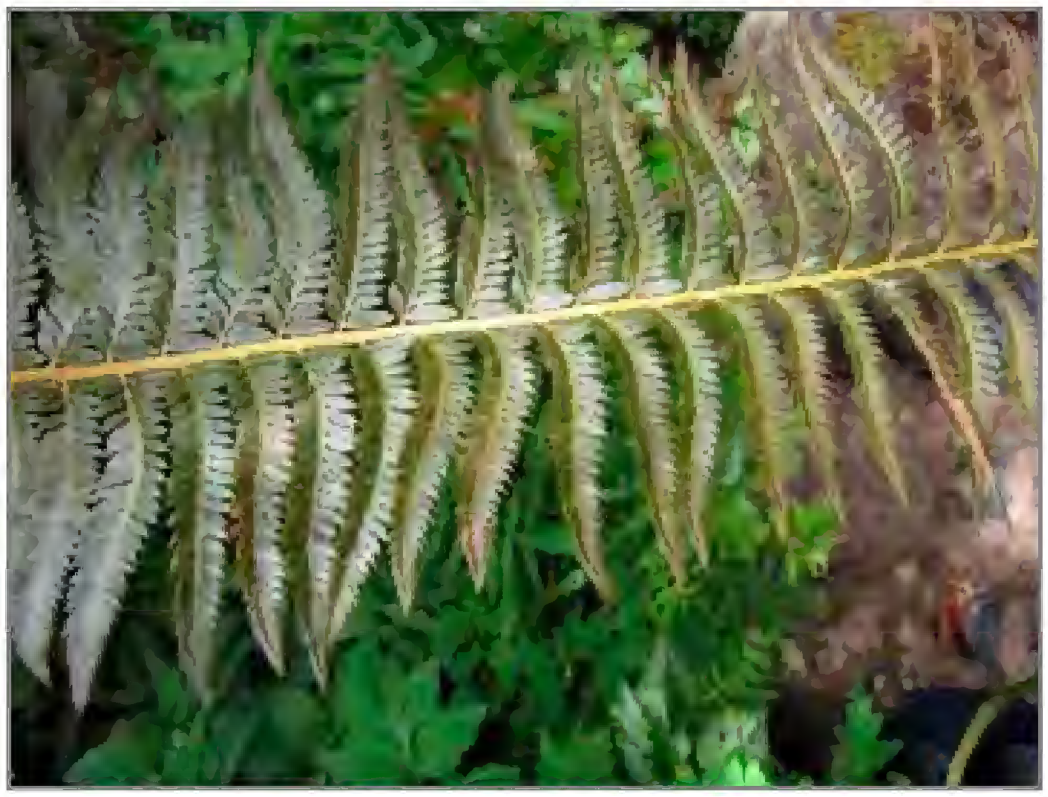

Fig. 2. Close up of mid-frond of *Polystichum* x *arendsii*, garden near Bromyard, Herefordshire. 11th May 2014

Polystichum munitum is not a rare plant in fern collections in Britain but it is not grown widely by the general gardening public. In this Bromyard garden there is one very mature plant and a small sporeling nearby. How extraordinary that this western American species should have crossed naturally with European *P. setiferum* (twice) and now *P. aculeatum*.

We will probably never know if the plants described by Christ arose naturally in the garden of Herr Arends, but here in Herefordshire I think it most unlikely that Dr Fisher was raising hybrids intentionally. Certainly in all my earlier visits to the garden I had never noticed this plant. In Dr Fisher`s day it was either very small or not there at all. I therefore think it has arisen recently and probably has a good claim to being a member, albeit half alien, of the British flora. ❐

Cultivar Country - Part 2

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This article is the follow-up to Cultivar Country - Part 1 which you will find on page 108. We will start with the homes of the two National Collection holders for various ferns.

Sizergh Castle

Sizergh Castle, just south of Kendal, has been associated with the Strickland family since 1239. The family gave the house to the National Trust in 1950, and it is set in a 1,600-acre estate

It is the home of the National Collections of *Dryopteris*, *Cystopteris*, *Osmunda* and *Asplenium scolopendrium* cultivars. The basis of the fern collection at Sizergh was the famous Bolton collection. Thank you to Michael Hayward who recently found out about the connection and passed it on to me.

Andrew Harrison, a BPS member, is now looking after the gardens and he is doing a lot to improve the collection, including the current development of a stumpery.

The gardens have ferns everywhere; even self sown ones seem to spring up where you least expect (Fig.1).

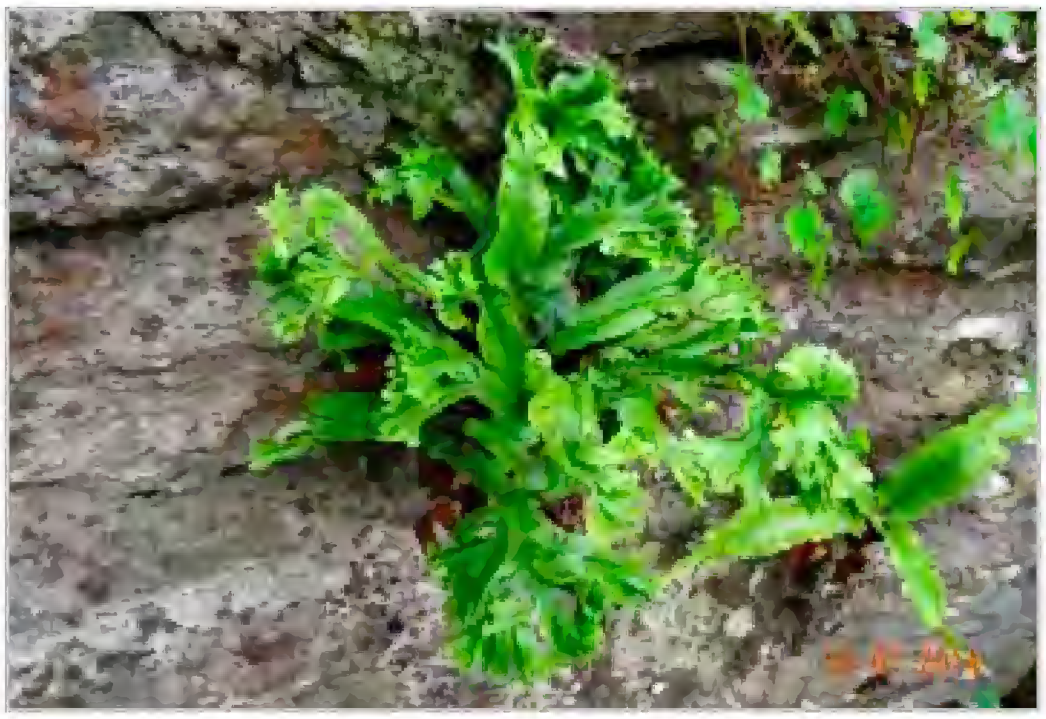

Fig. 1. *Asplenium scolopendrium* ‘Cristatum’
self sown in a wall

Among the fascinating ferns in this collection is an amazing scollie (Fig.2). It looks as if it could develop into a ‘Transverso-cristata.’

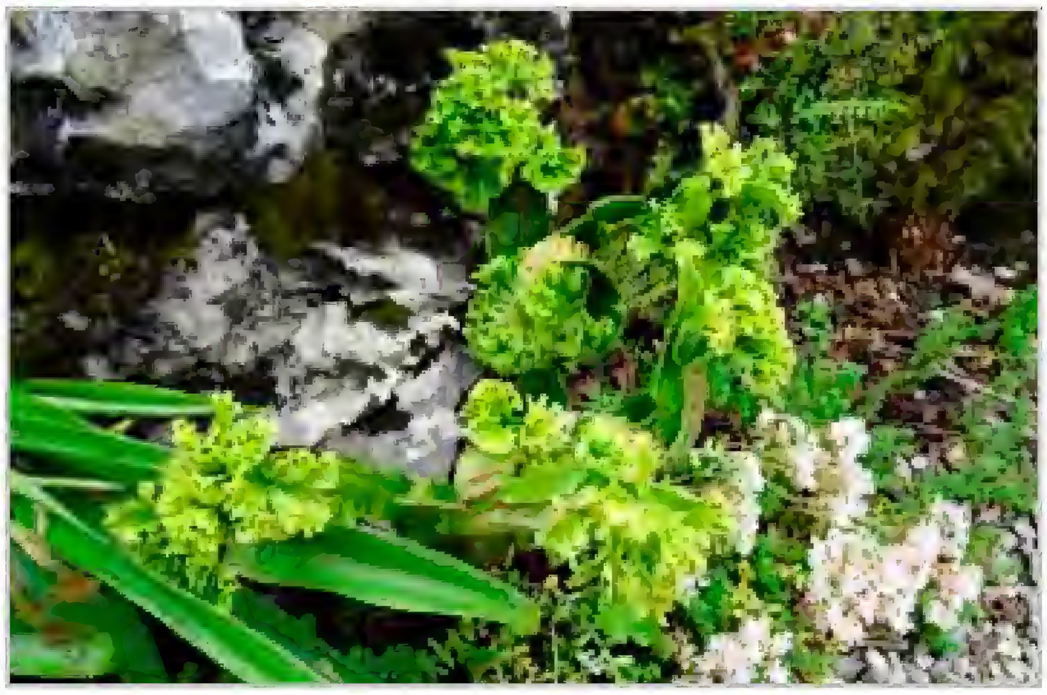

Fig. 2. A possible *Asplenium scolopendrium* ‘Transverso-cristata’

Something you rarely see is this crested Bracken (Fig. 3) which, if my memory isn't playing tricks, came from Reginald Kaye (*Pteridium aquilinum* ‘Cristatum’)

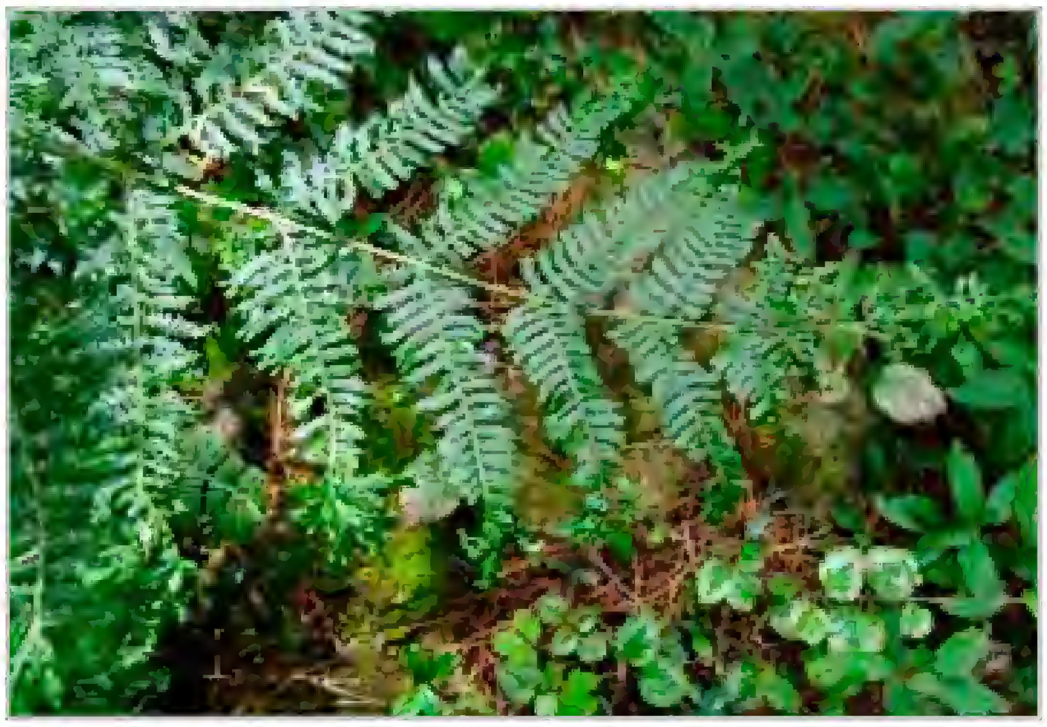

Fig. 3. A crested Bracken, *Pteridium aquilinum* ‘Cristatum’

This lovely *Asplenium scolopendrium,* labelled ‘Marginatum Undulatum’ (Fig.4), is really a very nice ‘Mucronatum Undulatum’ and is very dramatic.

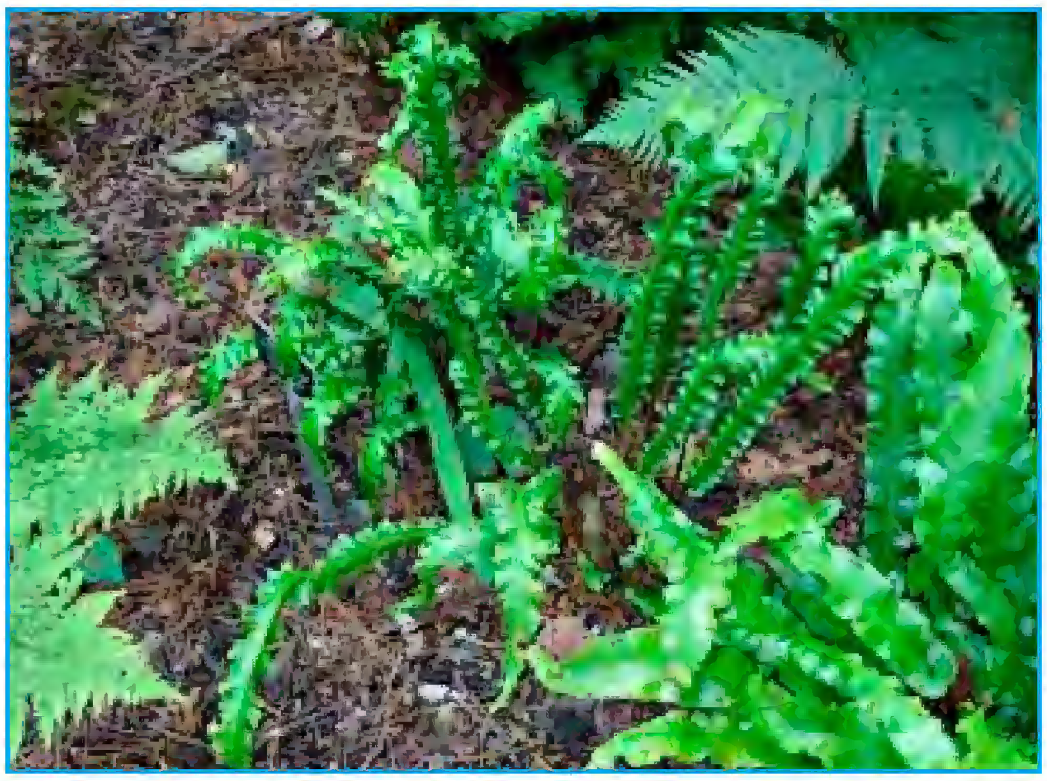

Fig. 4. *Asplenium scolopendrium* ‘Mucrunatum Undulatum’

Another scollie you do not see very often is *Asplenium scolopendrium* ‘Peraferens’ seen in Fig.5.

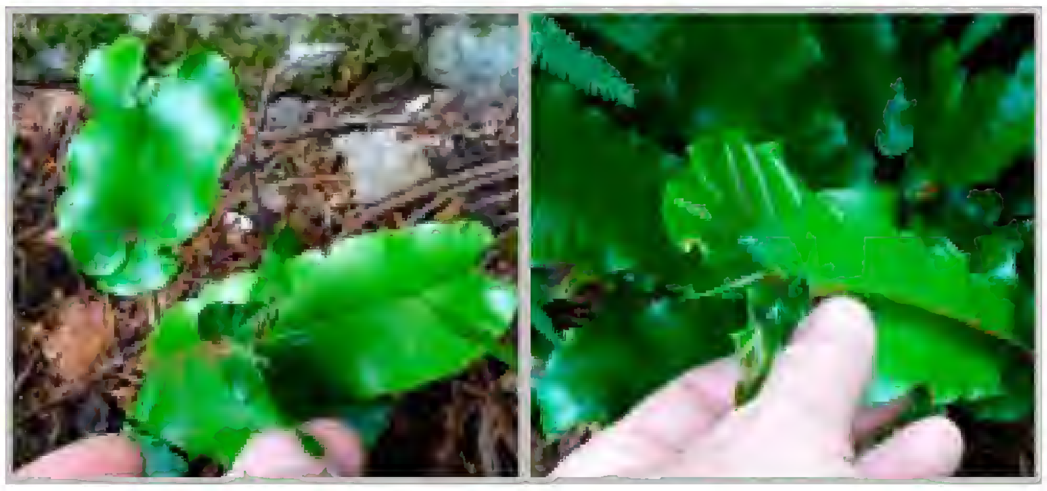

Fig. 5. *Asplenium scolopendrium* ‘Peraferens’

The queens of the scollies, the Crispum group, are normally sterile, but this sparingly fertile variety, *Asplenium scolopendrium* 'Crispum Fimbriatum*'* is very choice (Fig.6).

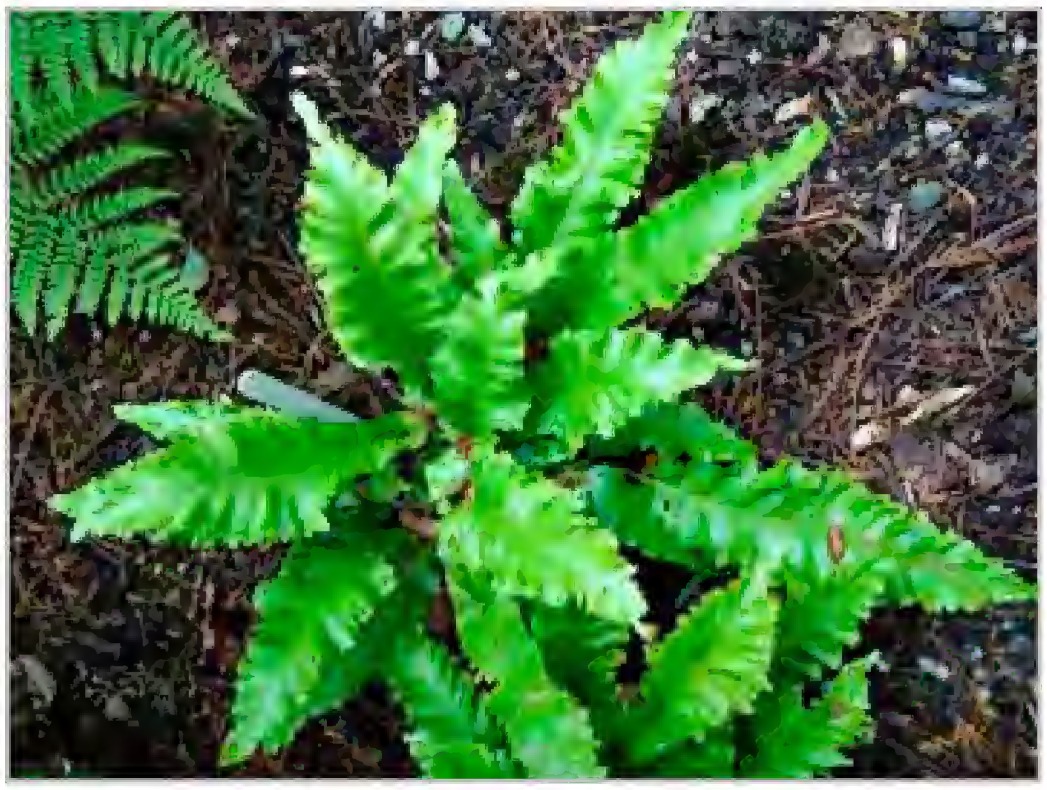

Fig. 6. *Asplenium scolopendrium* 'Crispum Fimbriatum'

Fig. 7 shows a fern I have never heard of before, *Asplenium scolopendrium* 'Crispum Wrigley,*'* very reminiscent of 'Crispum Fimbriatum.'

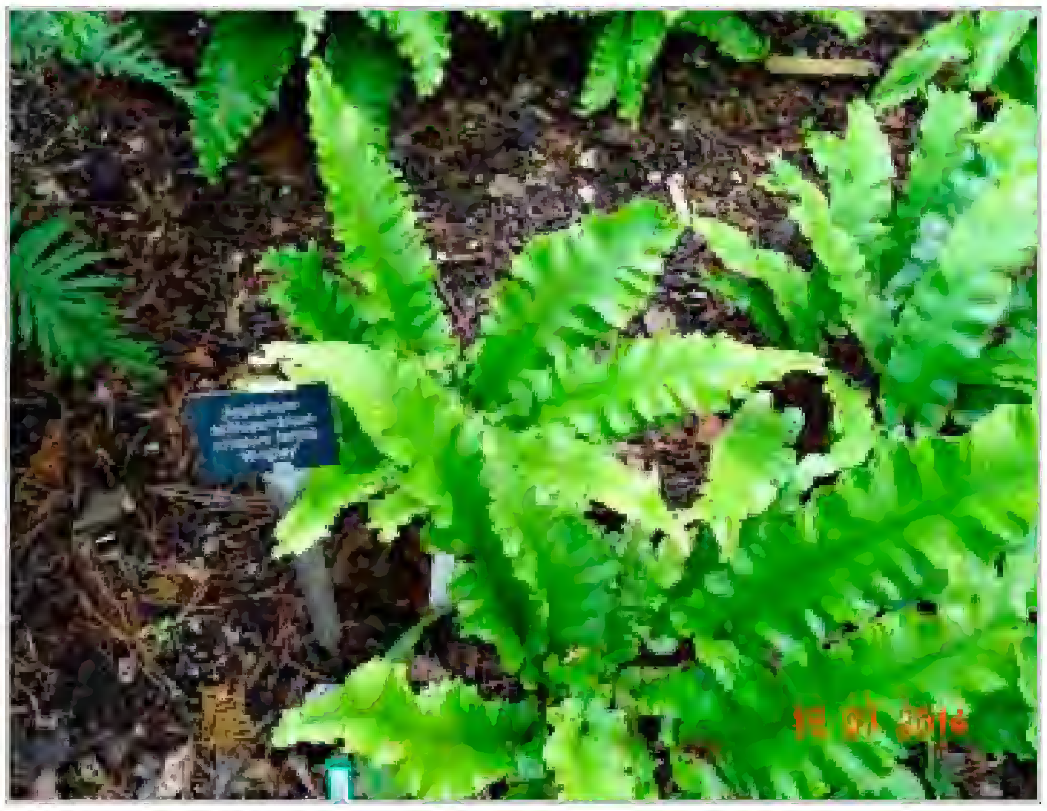

Fig. 7. *Asplenium scolopendrium* 'Crispum Wrigley'

This next fern (Fig.8) is like looking back to Victorian times. I have only dreamed of seeing a 'Digitatum' and this is the closest. *Asplenium scolopendrium* 'Digitatum Sizergh' — what an amazing plant.

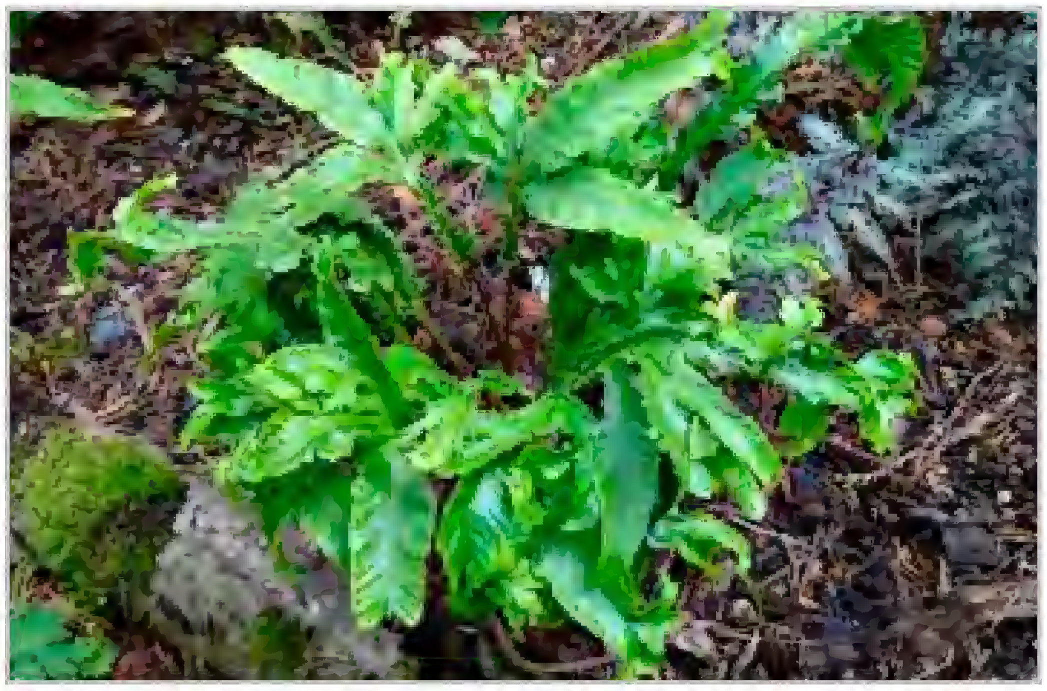

Fig. 8. *Asplenium scolopendrium* 'Digitatum Sizergh'

Sizergh also has a wide range of lady ferns, some of which are mentioned in a separate article on glomeratum developments (see page 103), as well as many *Polystichum* and *Osmunda* varieties.

In Fig. 9 is an *Athyrium filix-femina,* lightly tasselled on the tips of the pinnae and frond tips. The very elegant long fronds are on the lines of a 'Percristatum.*'*

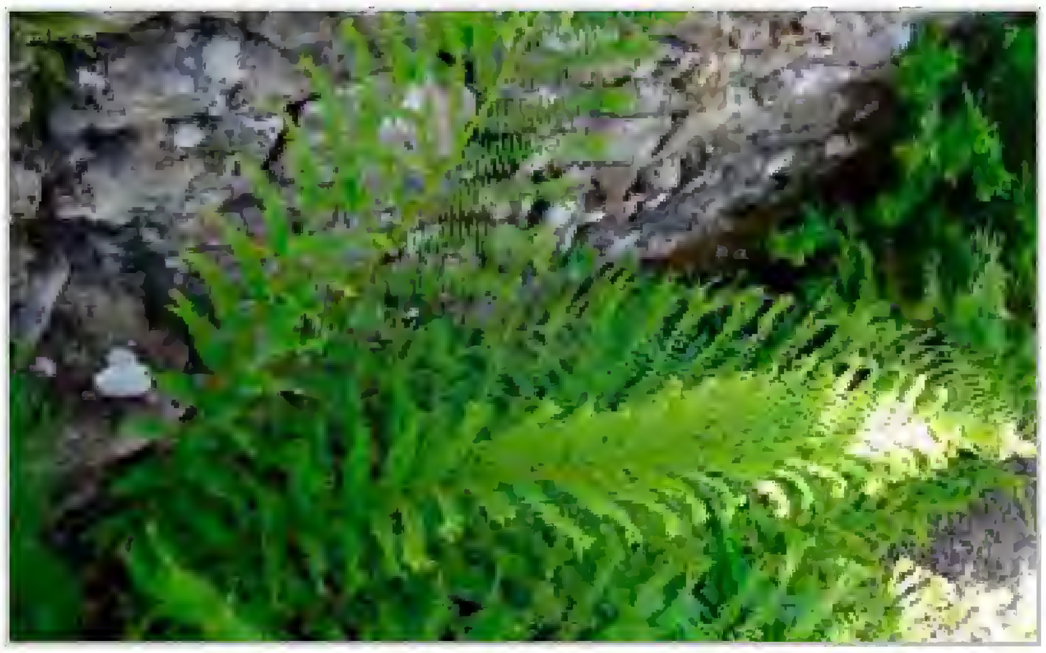

Fig. 9. A lightly tasselled *Athyrium filix-femina*. Reminiscent of 'Percristatum'

Fig.10 shows a large *Athyrium filix-femina* 'Grandiceps.'

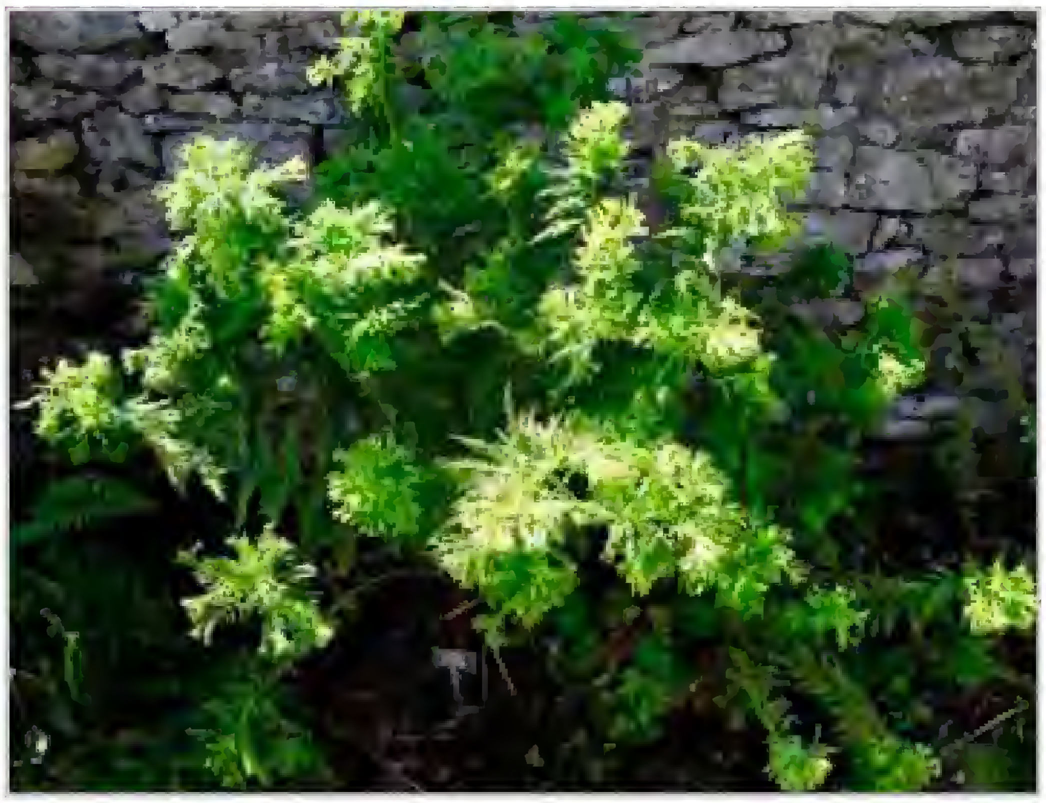

Fig.10. *Athyrium filix-femina* 'Grandiceps'

There are so many ferns in this garden that I would recommend at least a full day to visit and then another day to find all the other ferns that you missed the first time round. It would help if you contacted Andrew Harrison (e-mail: andrew.harrison@nationaltrust.org.uk) who will try to assist if you want to see something special.

Holehird

Holehird, near Windermere, is a 17-acre hillside garden managed on a voluntary basis by members of the Lakeland Horticultural Society. They have three National Collections, *Astilbe*, *Meconopsis* and, most important of all, *Polystichum*. The North West Group of the BPS hold their Annual General Meeting here in October.

Steve Mees, another BPS member, is responsible for looking after the ferns, which include 60 varieties and nine foreign species. He has done some considerable work in 2014 ensuring that the drainage is improved and creating a version of a stumpery which is referred to as a 'loggery.' Reginald Kaye supplied the basis of the collection with a gift of nearly 30 cultivars in 1987 and it is added to every year. For further details please see the *Pteridologist* 2011 edition (Vol 5, part 4).

Fig. 11 shows a very elegant fern, *Polystichum setiferum* 'Conspiculobum.' This is quite rare.

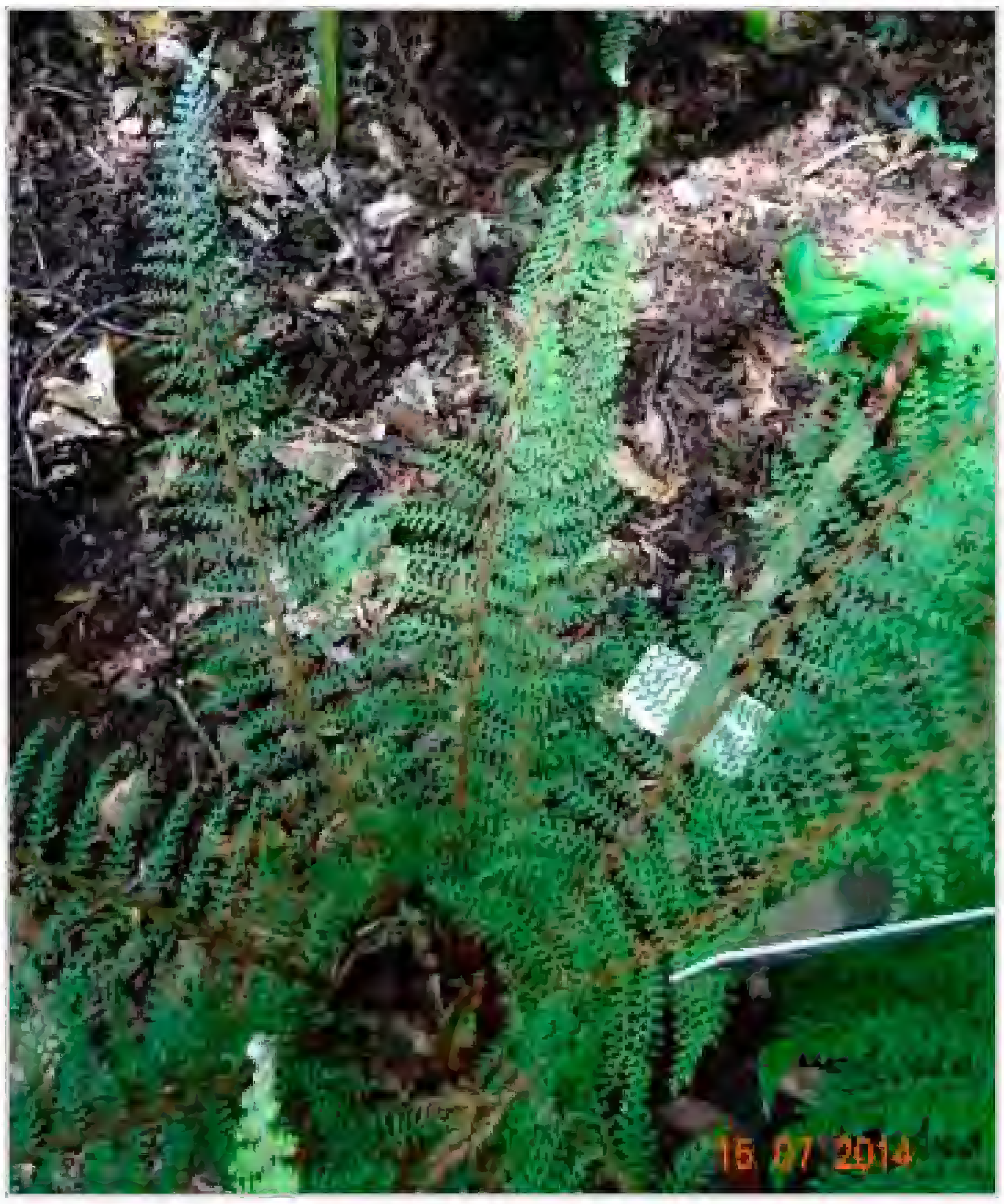

Fig. 11. *Polystichum setiferum* 'Conspiculobum'

Fig. 12 shows a lovely fern that isn't rare but very dramatic. Here it is labelled *Polystichum setiferum* 'Depradatum Group' but I know it as 'Cristato-pinnulum.' Easy to grow but not seen enough.

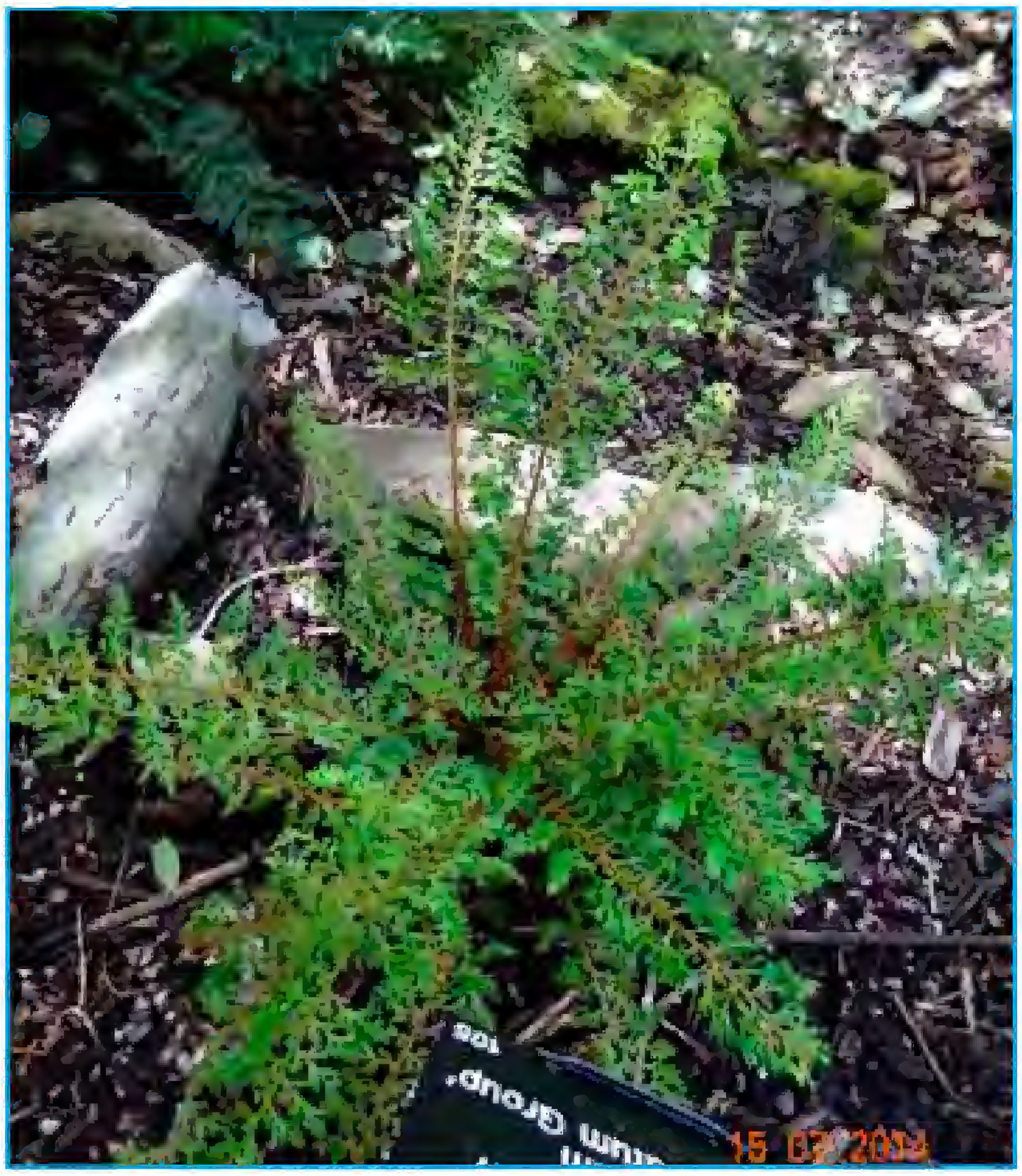

Fig. 12. *Polystichum setiferum* 'Depradatum Group'

There are so many beautiful ferns in this garden and this is just a taster. If ever you are in the area please make a point of visiting. The setting is superb with views over the Lakeland fells. Thank you, Steve for taking the time to show me the many beautiful varieties.

Ormandy House, Robert Sykes.

Robert Sykes, a past president of the BPS, lives in Crosthwaite to the west of Kendal. He is moving house and has given a lot of ferns away to good homes. He gave me some lovely specimens of his *Polypodium* 'Cornubiense Group' that he grew from spore (Fig.13).

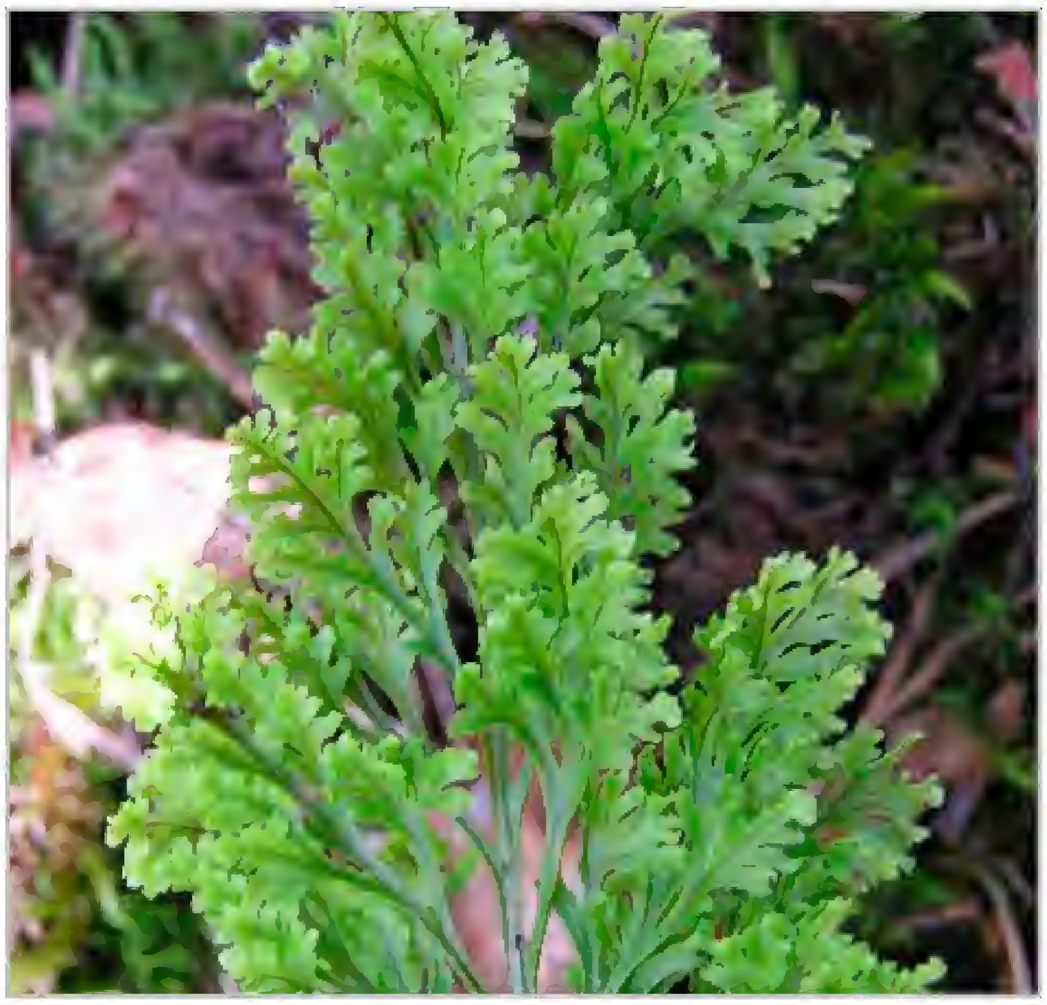

Fig. 13. *Polypodium* 'Cornubiense Cristatum'

Mayfield, Melville Thomson.

Melville is a long standing member of the BPS and lives in Arnside which overlooks Morecambe Bay.

A gentle man through and through, he has many a lovely species in his garden and other choice plants, as well as a magnificent *Polystichum* that I will mention in a different article.

Amongst my favourites was this *Asplenium scolopendrium* 'Transverso-cristatum' to be seen in Fig. 13.

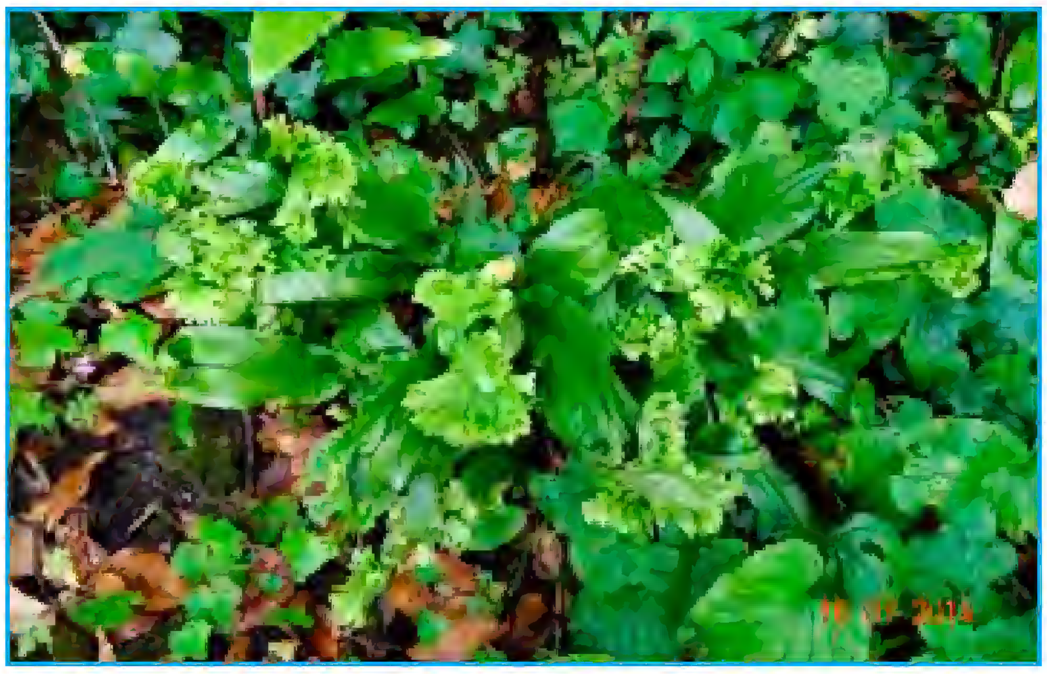

Fig. 13. *Asplenium scolopendrium* 'Transverso-cristatum'

Below, in Fig. 14, is a magnificant *Polystichum setiferum* (Divisilobum Group).

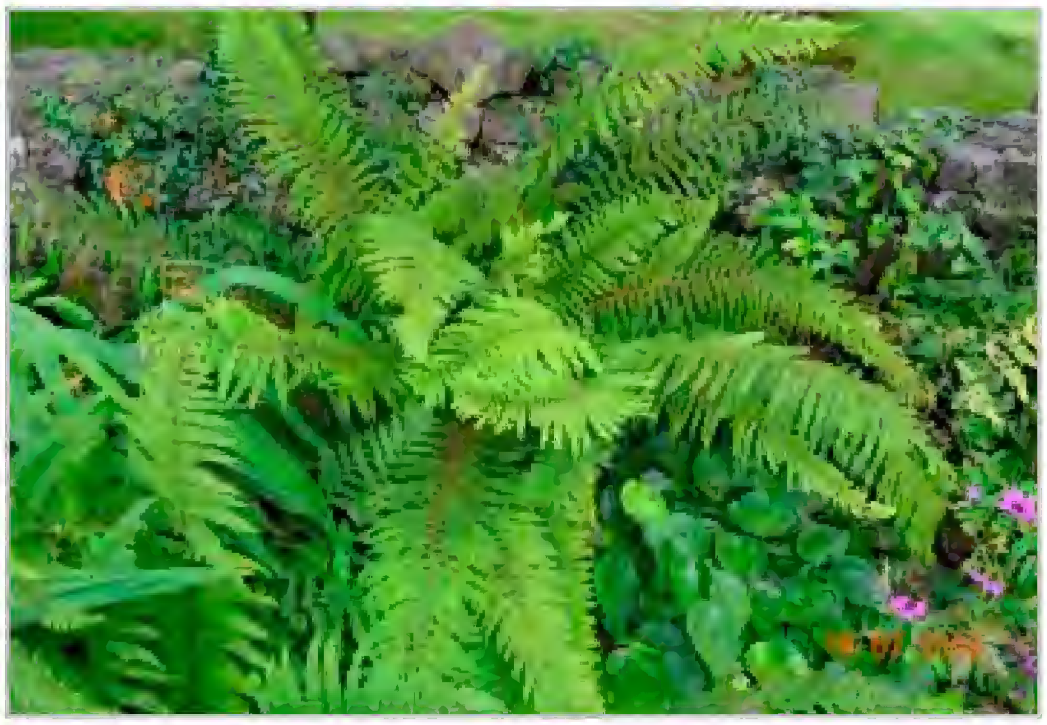

Fig. 14. *Polystichum setiferum* (Divisilobum Group)

Fig 15 shows a massive plant of *Polystichum setiferum* (Ramosum Group) 'Robert Sykes' growing near his back door.

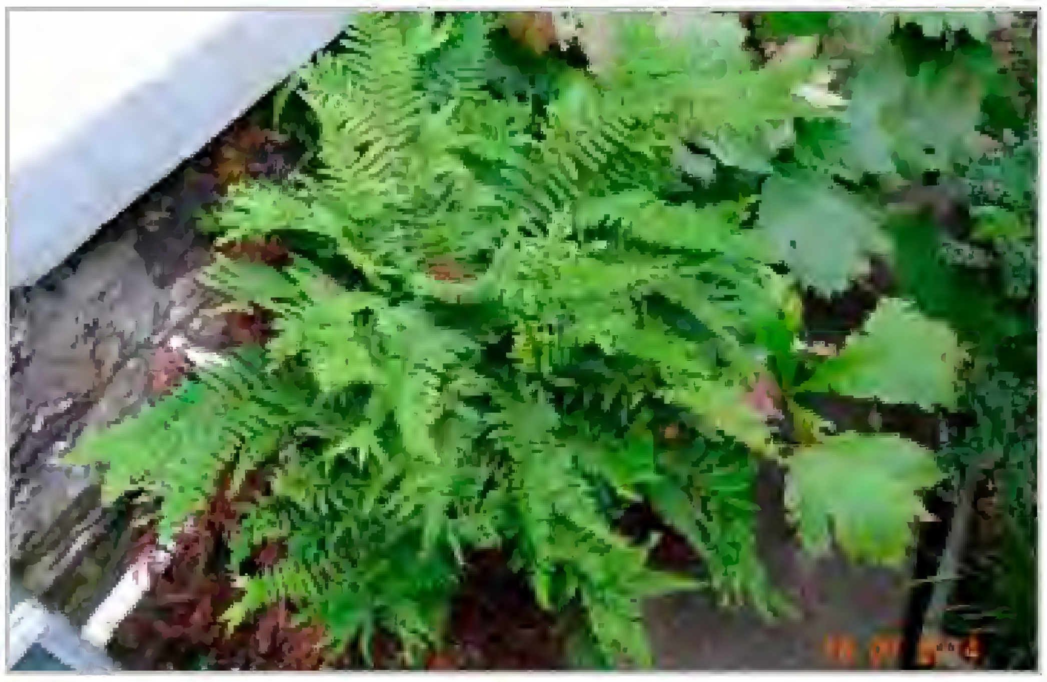

Fig. 15. *Polystichum setiferum* (Ramosum Group) 'Robert Sykes'

Orchard Cottage. Chris and Shirley Band.

Chris and Shirley live in Levens. They too open their garden for the National Gardens Scheme. We saw a wide range of lovely ferns including this *Athyrium filix-femina* 'Vernoniae' (Fig.16), an easily grown variety that is readily available from fern nurseries but not seen often enough.

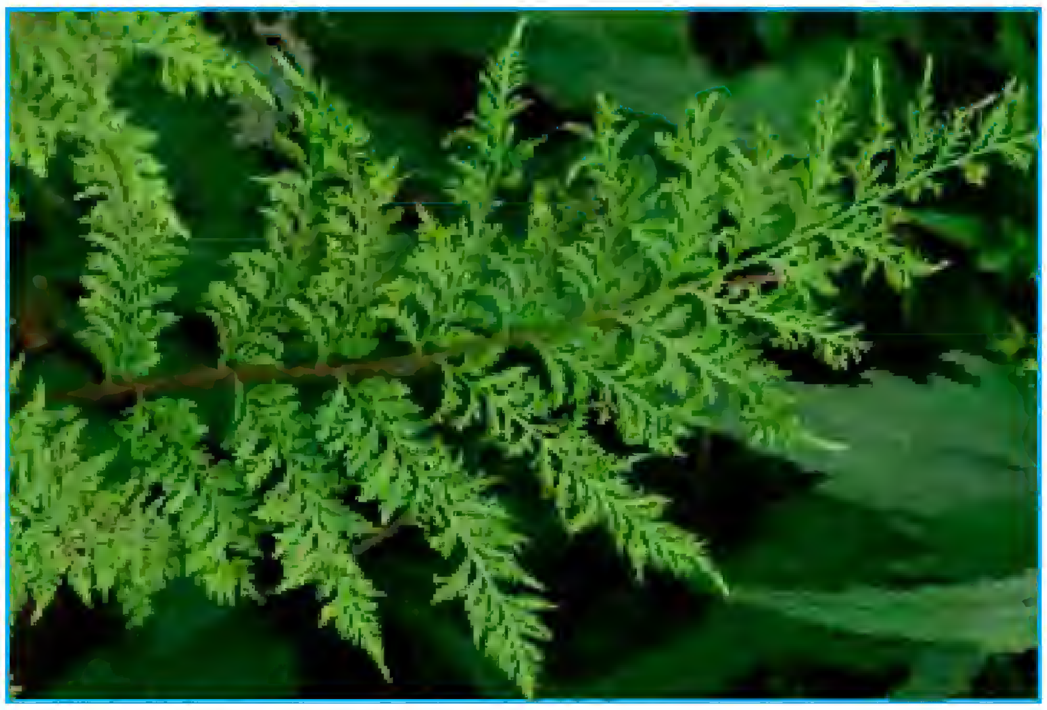

Fig.16. *Athyrium filix-femina* 'Vernoniae'

Although seen earlier in the week it was good to see another *Polystichum setiferum* 'Cristato-pinnulum' (Figs.17 & 18). When grown from spores they do vary but are all very nice.

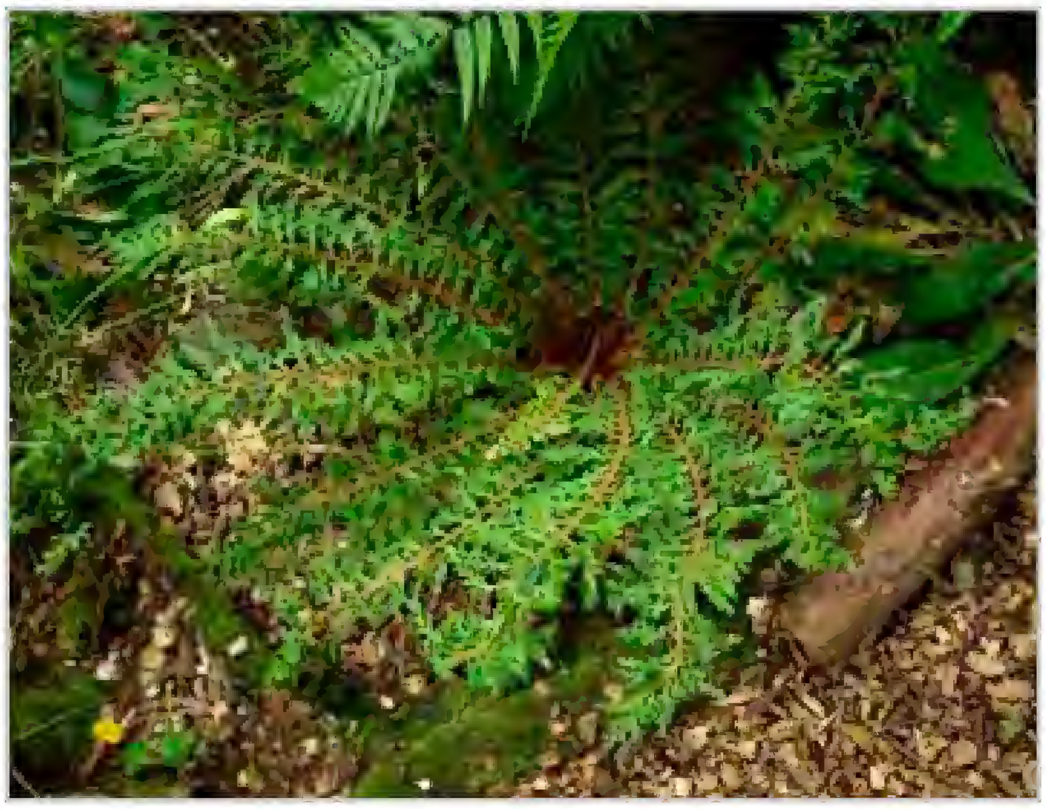

Fig. 17. *Polystichum setiferum*
'Cristato-pinnulum'

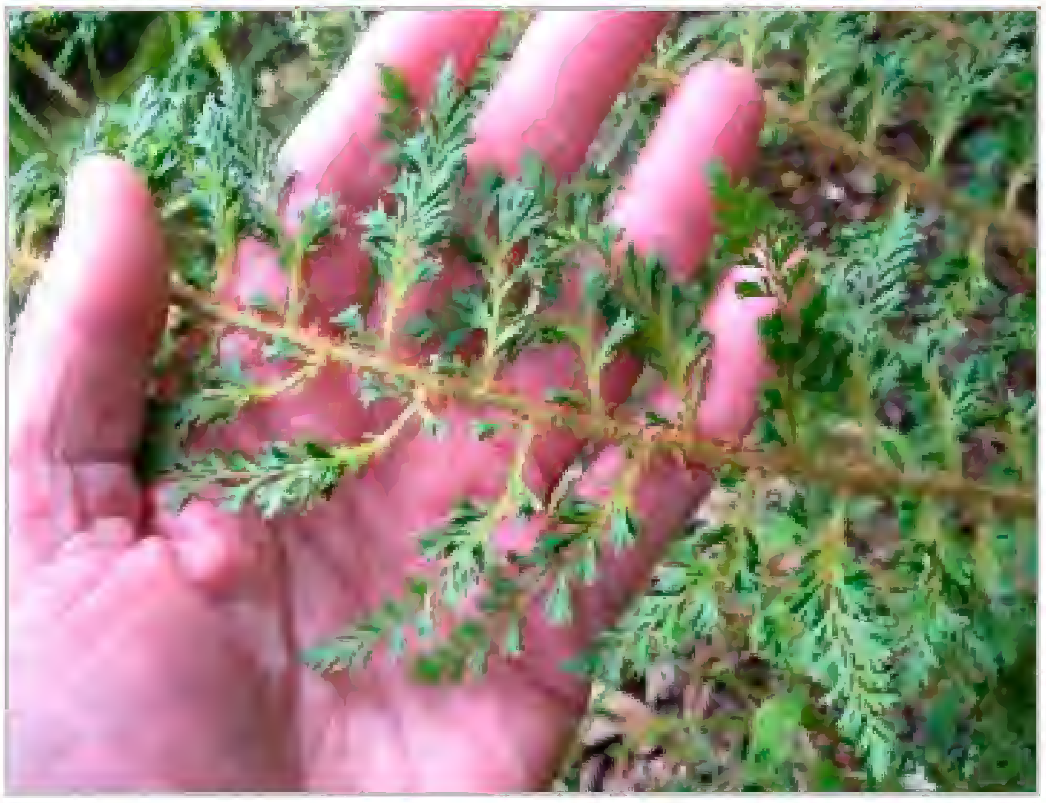

Fig. 18. Detail of *Polystichum setiferum*
'Cristato-pinnulum'
(Photo: Bruce Brown)

Below, in Fig. 19, is *Athyrium filix-femina* 'Victoriae.' A remarkable cultivar found near Loch Lomond. (See article by Adrian Dyer in *Pteridologist* 2014 Vol 6 Part 1).

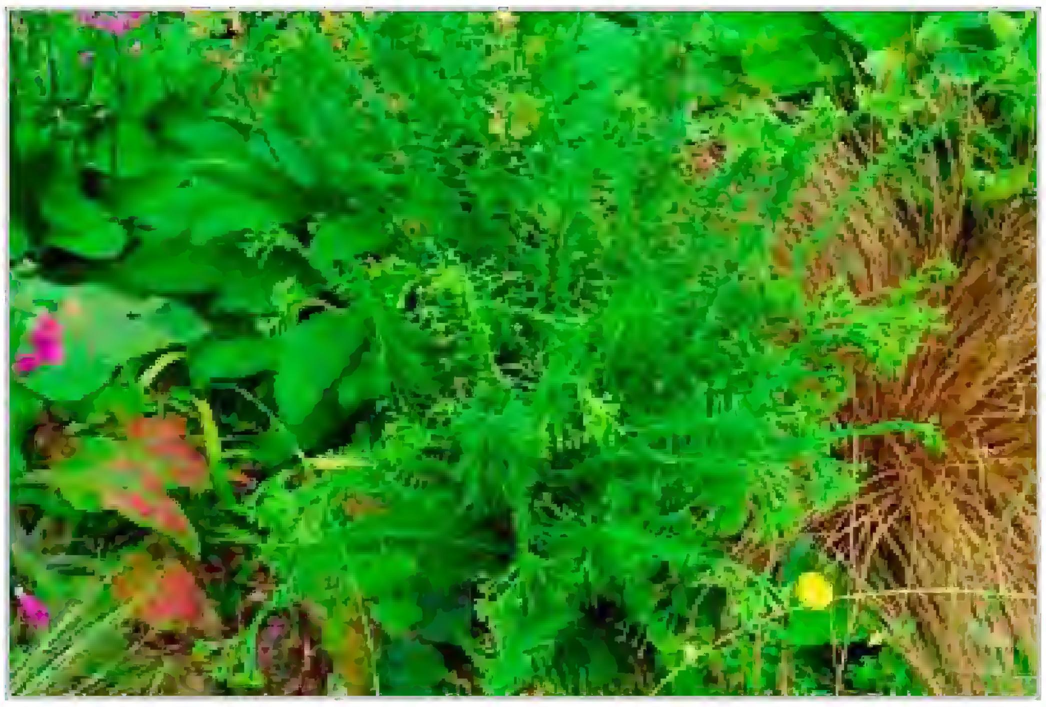

Fig. 19. *Athyrium filix-femina* 'Victoriae'
(Photo: Peter Campion)

Although quite common, *Polystichum setiferum* 'Divisilobum' (Fig.20) is still a lovely plant to see.

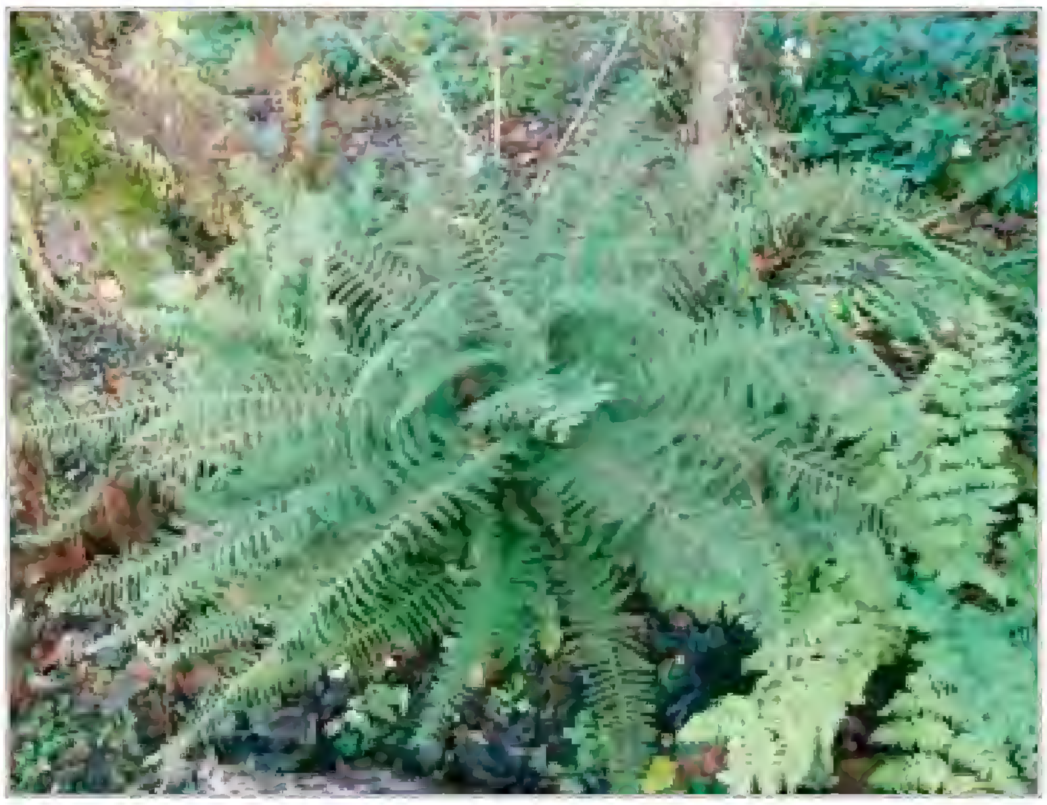

Fig. 20. *Polystichum setiferum* 'Divisilobum'
(photo: Alec Greening)

A big thank you to Chris and Shirley for letting me see their garden and for a lovely tea.

Springfield House, Alison and Chris Evans.

Alison and Chris, I owe you both an apology. Somehow I must have deleted the pictures of your wonderful ferns by mistake. There were some lovely plants including some great foliose Polystichums and also a beautiful greenhouse of ferns. Some notable ferns include this *Polystichum* (Fig. 22) which has characteristics of 'Iveryanum' and it is also crisped and congested with the whole stipe standing bolt upright.

Alison and Chris have a large range of *Polypodium* species and some cultivars. This one (Fig.21), *Polypodium cambricum (australe)* 'Richard Kayes' should be in every collection. It is easy to grow, very hardy and fully winter green, superb in the front of a bed to hide the likes of lady ferns in winter.

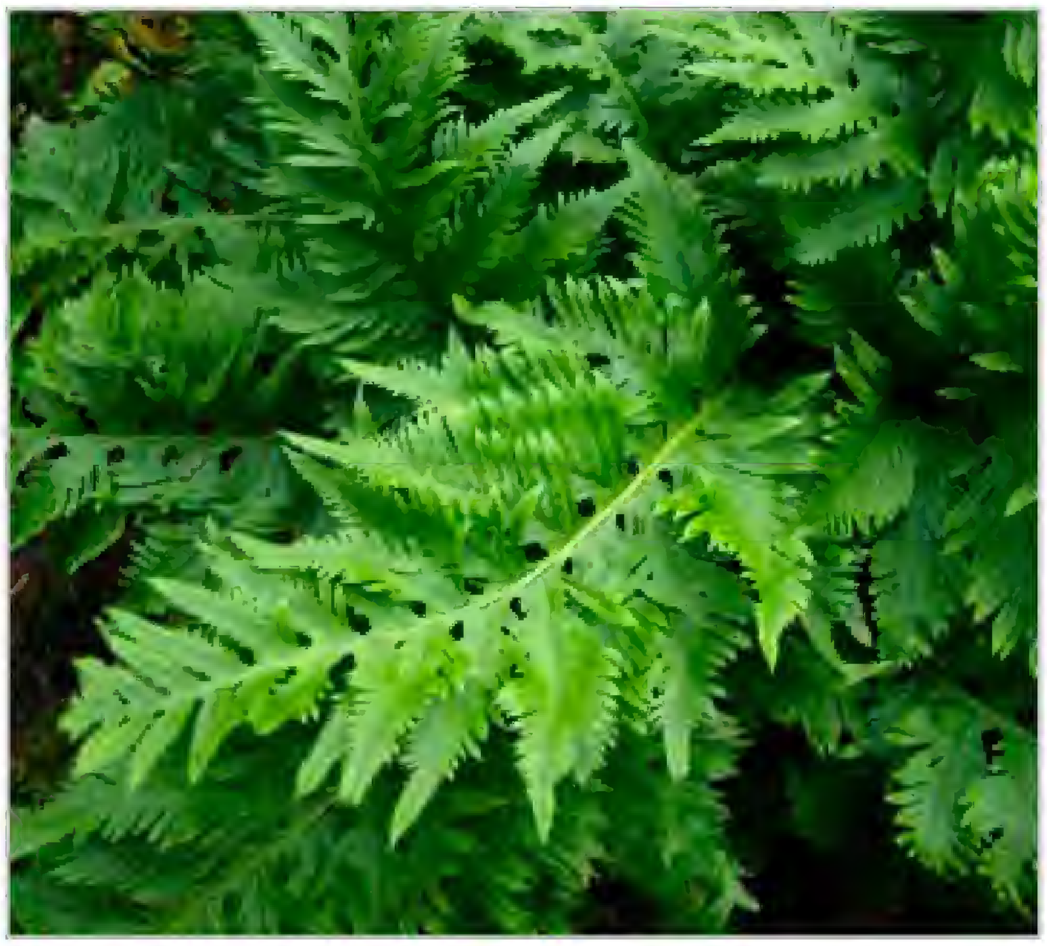

Fig. 21. *Polypodium cambricum* (*australe*) 'Richard Kayes'

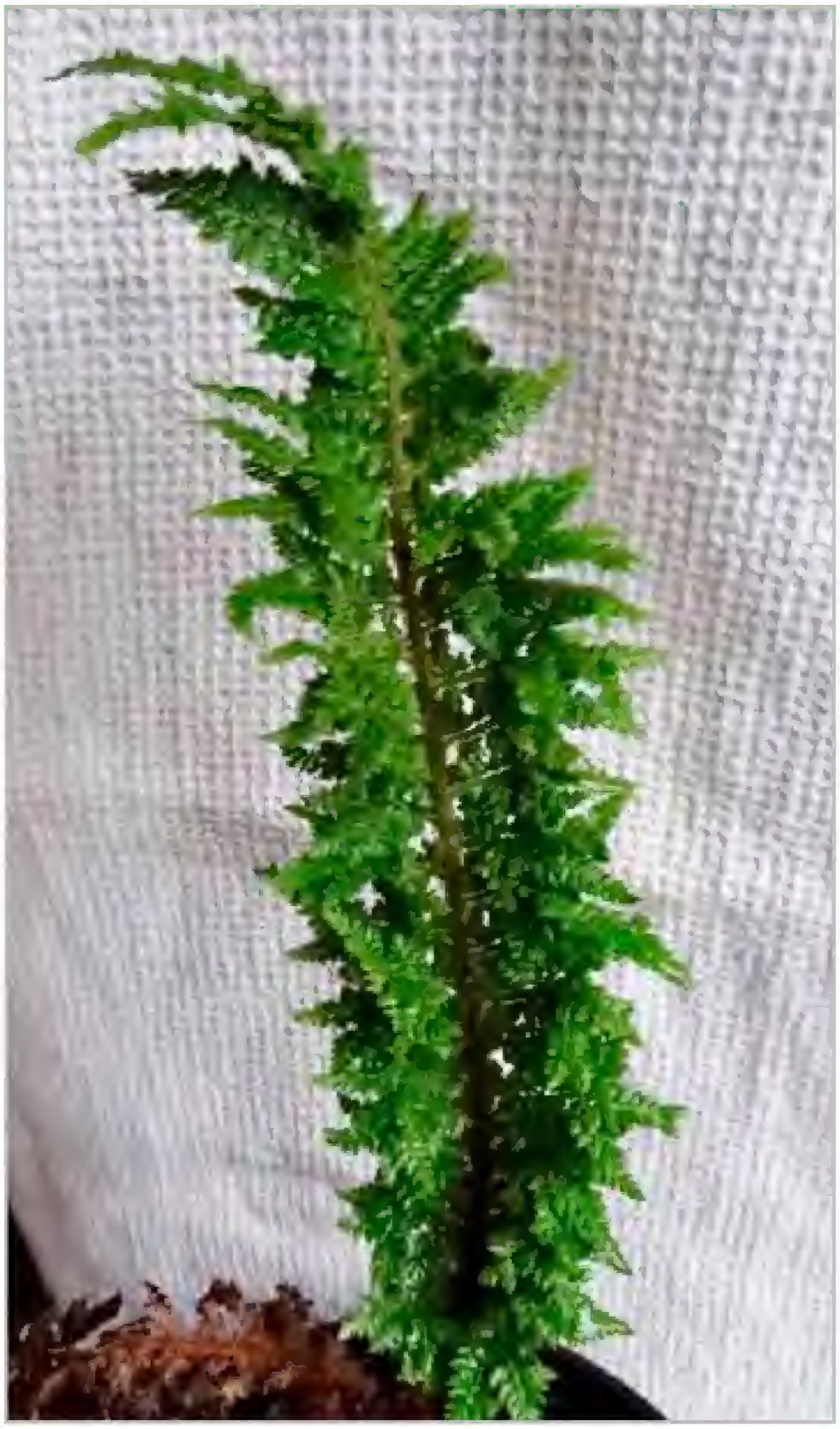

Fig. 22. An unusual *Polystichum setiferum* with a very upright stipe

The Bolton collection
(Fern lover's heaven!)

Just over the Cumbrian border, in Lancashire, is the village of Warton. It is famous for being the birthplace of George Washington and the home of the Bolton family. I was taken there one evening, not knowing what to expect. We parked in a small main road and walked to Heaven!

Right next to the main road is the home of Colin Bolton and his small garden is devoted to ferns that have been found by his family in the past. I am not sure of what I was seeing some of the time.The names are more of a suspicion of what these beautiful ferns were, but wow, what beauties!

I was blown away by what was there. The Cultivar Group of the BPS often comes into contact with Bolton cultivars. It would appear that we owe them so much. They must have searched the surrounding area extensively to come up with such gems. Recent forays in the area have not been so lucky.

Names such as *Asplenium scolopendrium* 'Crispum Bolton's Nobile,' 'Crispum Fimbriatum Bolton,' 'Crispum Variegatum Bolton,' *Athyrium filix-femina* 'Clarrissima Bolton' and 'Gemmatum Bolton' immediately spring to mind.

In Fig. 23, below we can see to the front left a lovely *Asplenium scolopendrium* 'Crispum' and behind it is, I suspect, 'Boltons Crested.' Can anybody name the rest of these wonderful ferns?

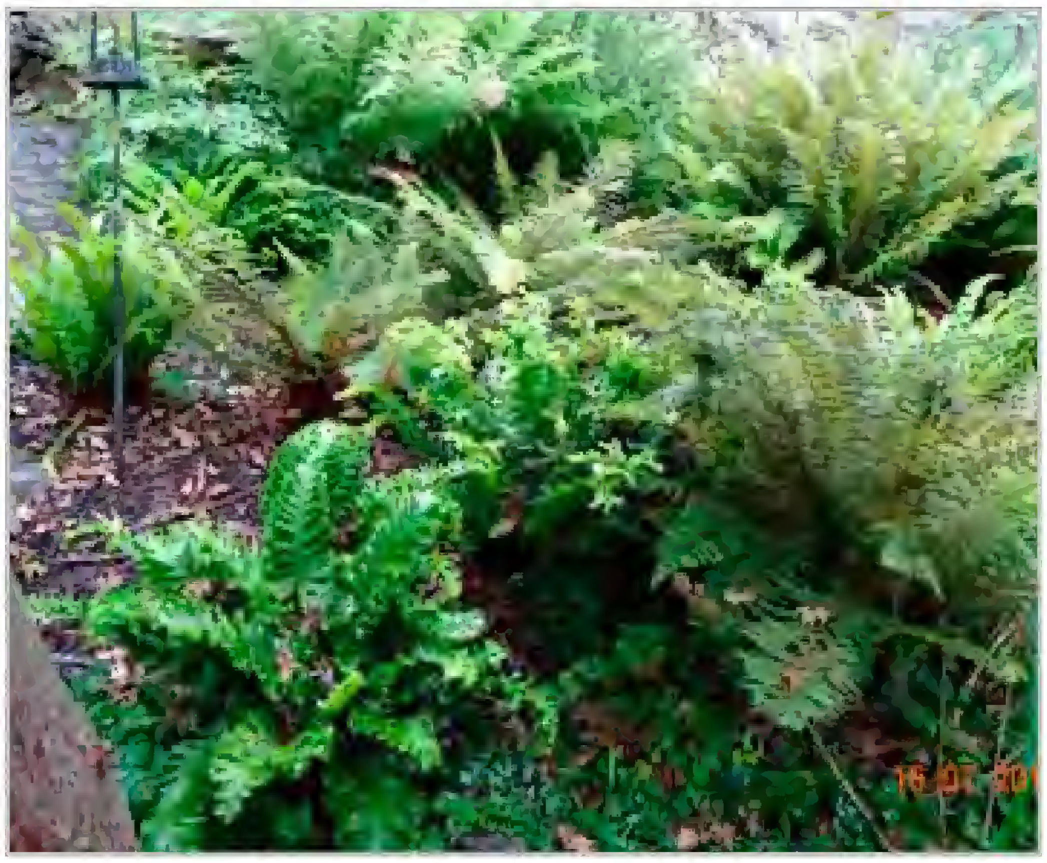

Fig. 23. A section of the Bolton collection

Fig. 24 shows an amazing *Polystichum setiferum*. It looks as though it is many years old.

The rest of the photos on this page show various views of the Bolton Collection. The garden is very small but it is totally devoted to ferns. The cottage is in the middle of a small junction so you are able to walk almost completely around this amazing collection.

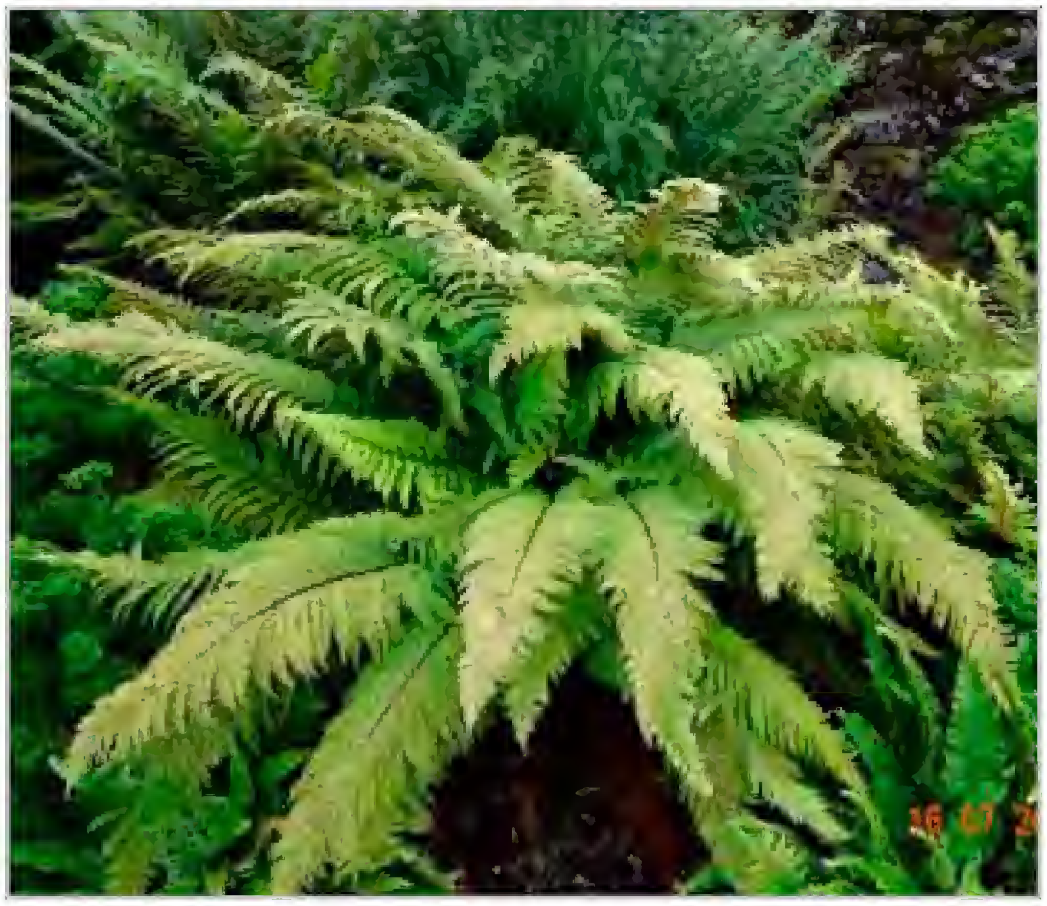

Fig. 24. A beautiful tripinnate *Polystichum setiferum* in the Bolton garden

It appeared that Colin Bolton was away at the time of my visit, so I had to be satisfied with peering over the garden wall. When I visit this garden again I am going to make sure that I get permission to walk amongst the ferns and study them close up. I could be there for hours!

Martin Rickard has made many visits to this garden and has tried to obtain divisions of some of the rarities. I hope he succeeds one day so that we can all enjoy these ferns by spreading them about the society. As the Terminator once said, "I'll be back"!

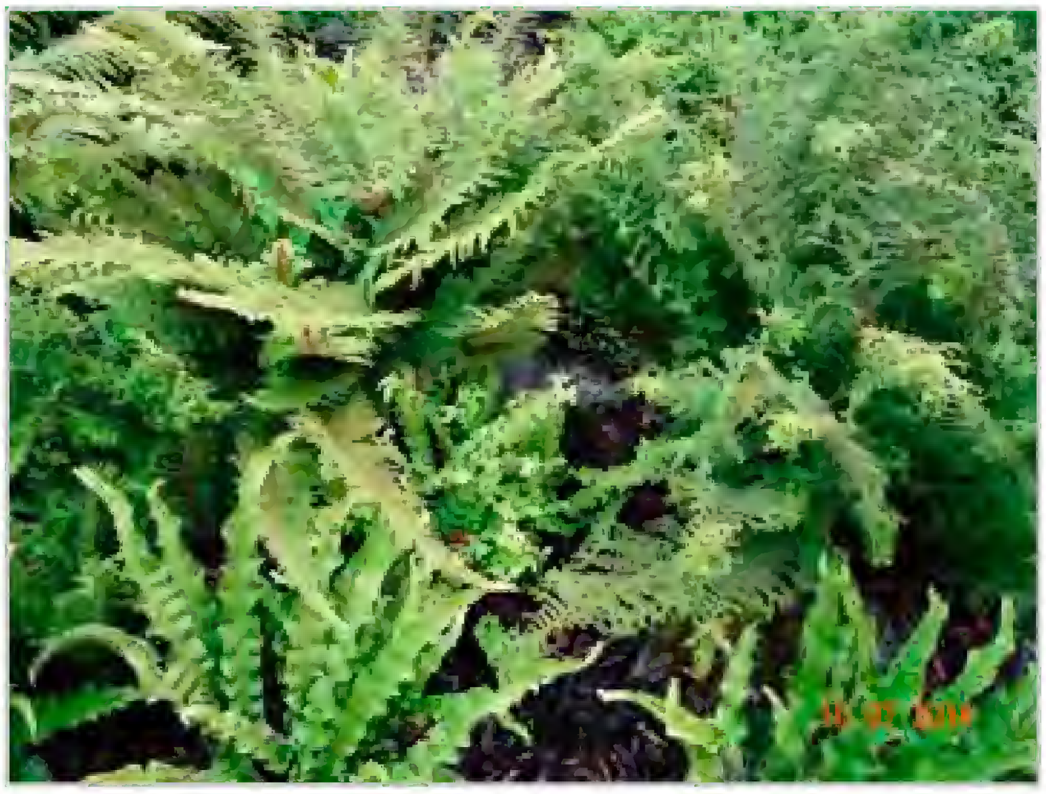

Fig. 25. Some stunners in the Bolton garden.
In the front are some 'Undulatum' Aspleniums, crested Athyriums and crested *Dryopteris*. In the top left a *Polystichum setiferum* 'Divisilobum'

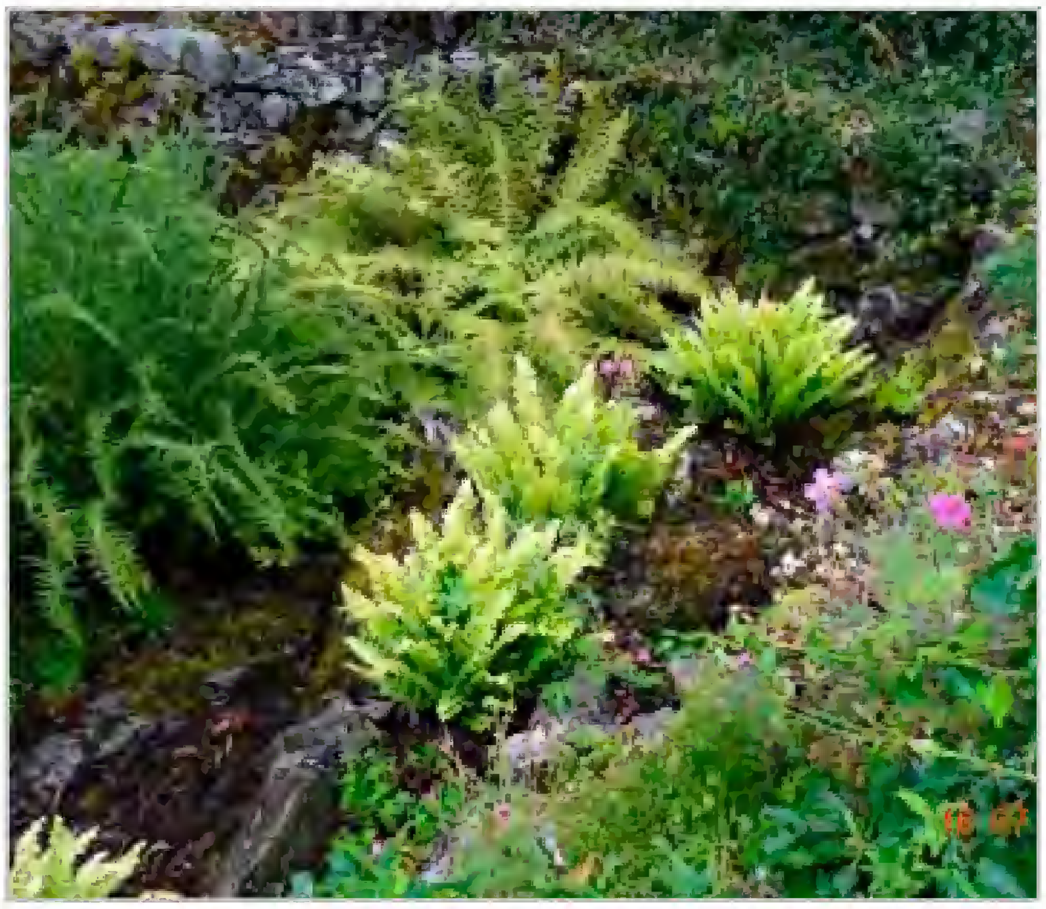

Fig. 26. More stunners in the Bolton garden.
The golden fronds are *Asplenium scolopendrium* 'Crispum.' Near the back a *Polystichum setiferum* 'Divisilobum' and an *Athyrium filix-femina* 'Cruciate Group' to the left

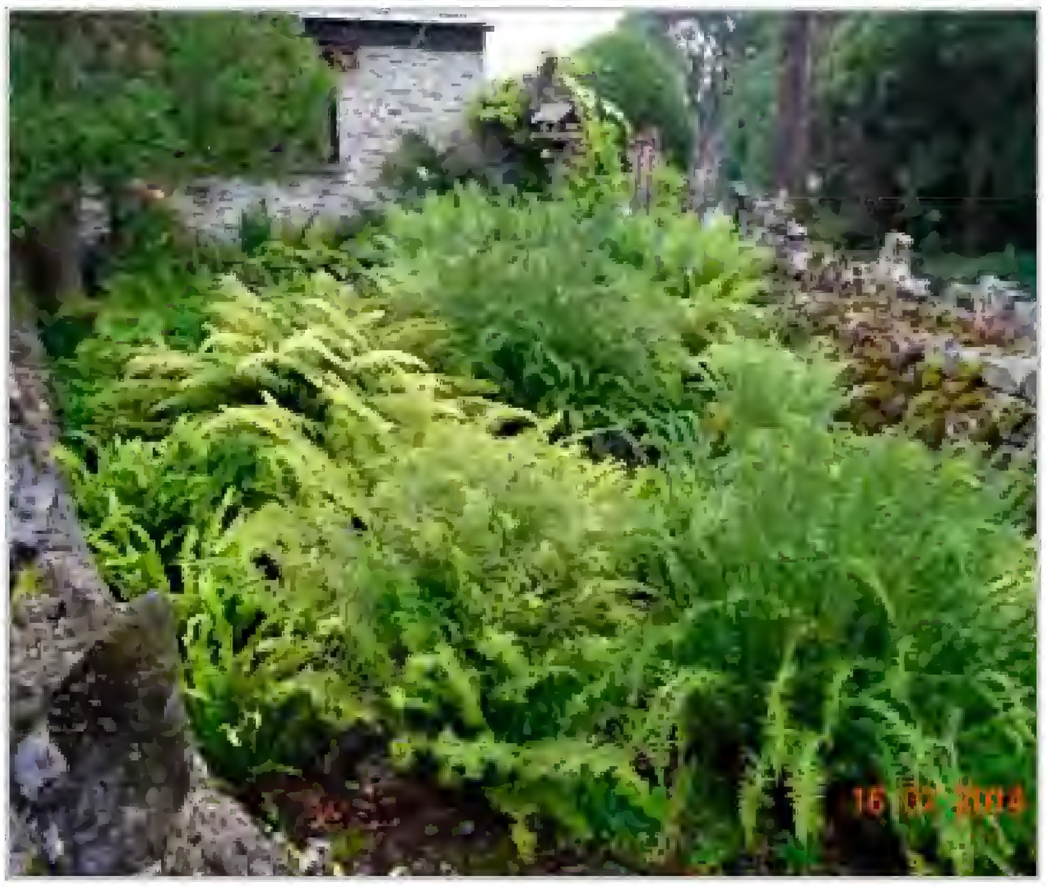

Fig. 27. A general view across this amazing collection. Note how small the garden is, yet there are ferns everywhere

44 Willow Hey. Steve Coleman.

On my way back home from The Lakes I called in on Steve Coleman, who lives in Maghull. It was only supposed to be a quick stop but I finished up staying for over three hours.

Visitors to Southport Show might have seen Steve helping out on the BPS stand. Many people don't know that he helps Michael Hayward set up and dismantle. In 2014 he exhibited for the first time at the show with resounding success. His garden is a theatre of wonderful plants. Look at Fig. 28, what an impact!

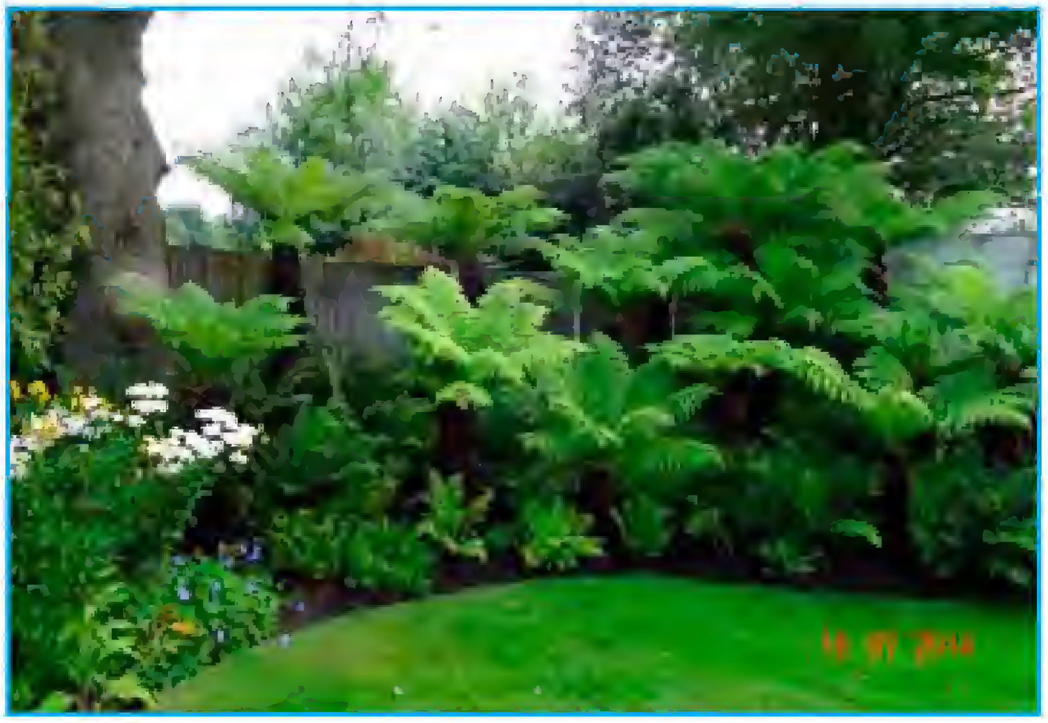

Fig. 28. A general view of Steve's garden showing the impact of his planting

Nestled amongst his *Dicksonia antarctica* were self sown Athyriums, one of which is ramose and crested (Fig. 29).

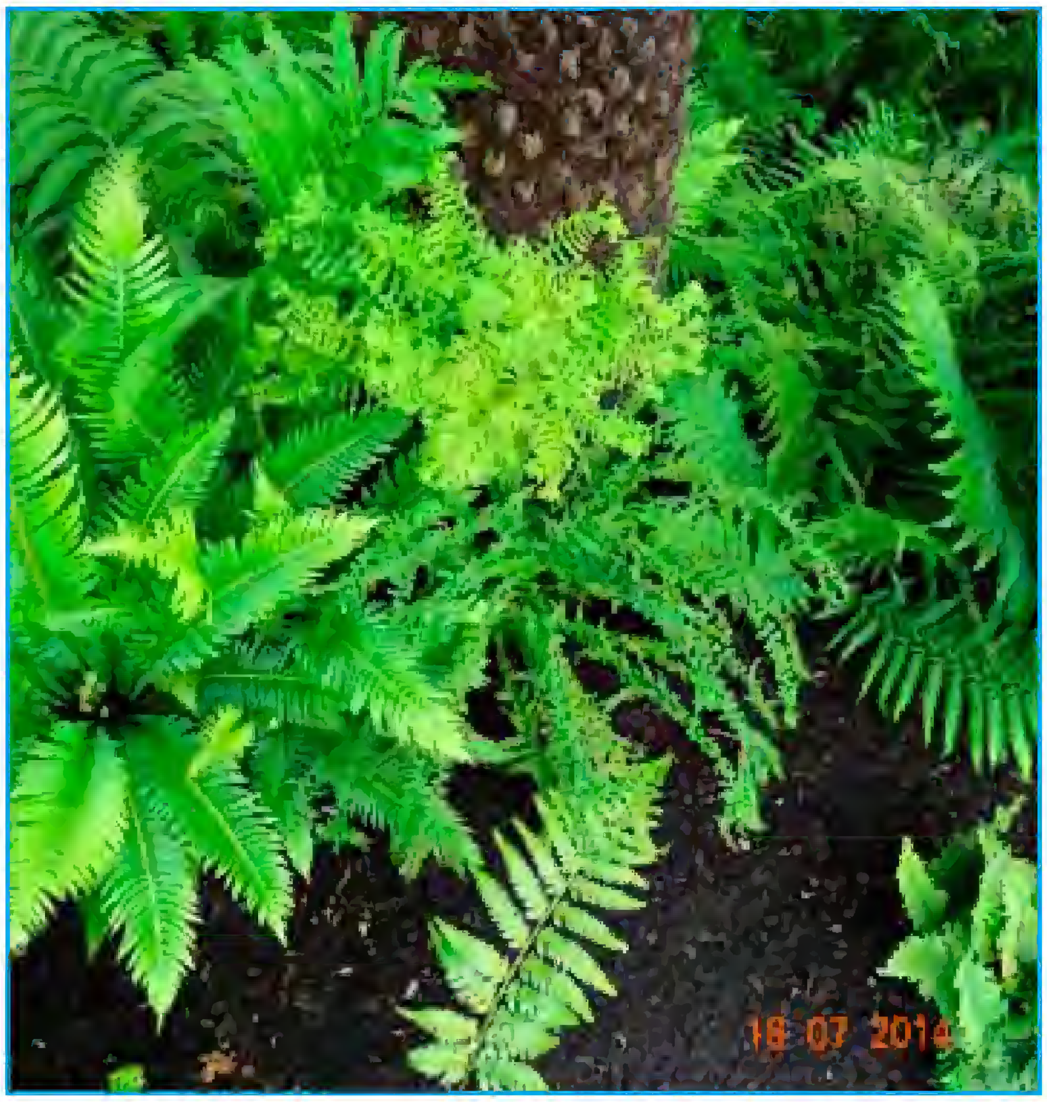

Fig. 29. A ramose crested *Athyrium* self sown amongst the trunks of *Dicksonia antarctica*

In Fig. 30 we can see some of the superb cultivars in Steve's garden. In the middle is *Athyrium filix-femina* (Capitatum Group), a gift from Yvonne Golding, and in the bottom left-hand corner a beautiful *Athyrium filix-femina* 'Frizelliae Multifidum.' This plant has earned the nickname of 'Alec Greening' as it was given to Steve by Alec.

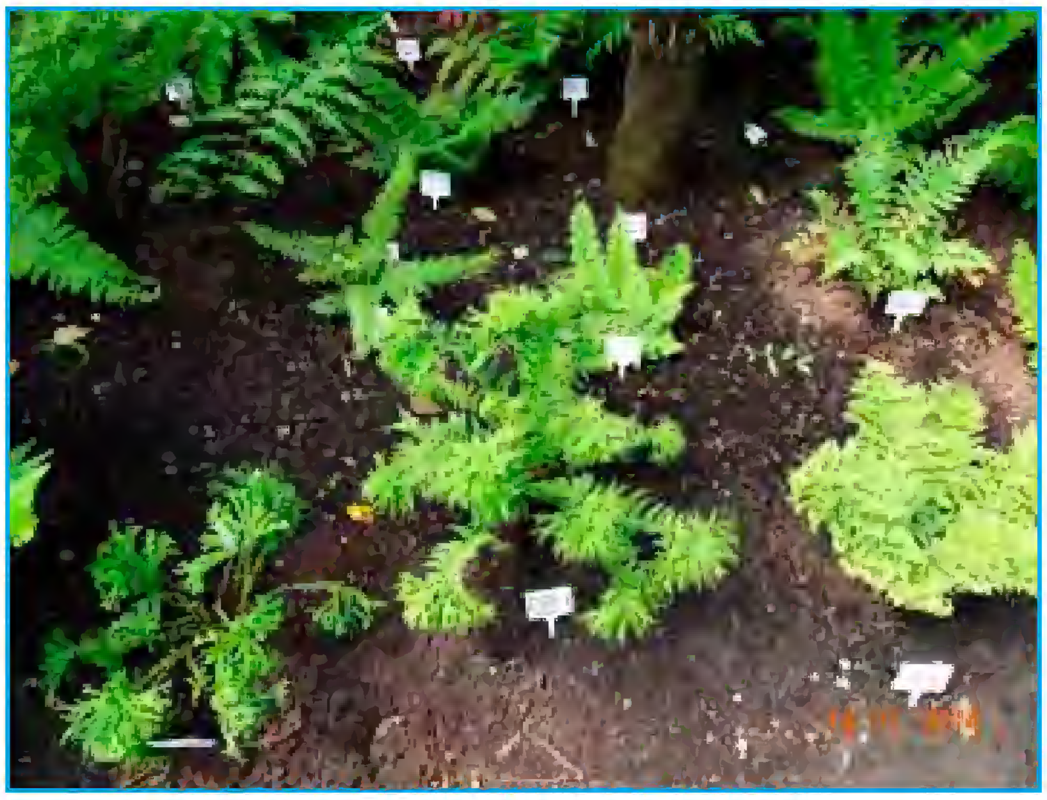

Fig. 30. Just some of the cultivars to be seen in Steve Coleman's garden

As you can see in Figs. 30 and 31 there are very many white labels. Each marks a special fern. Steve has a phenomenal selection of plants and is an incredible cultivar hunter. There are just too many to mention and I hope to visit this garden again, with more time, to give it the credit it deserves. Steve keeps his garden so tidy, it makes mine look a mess.

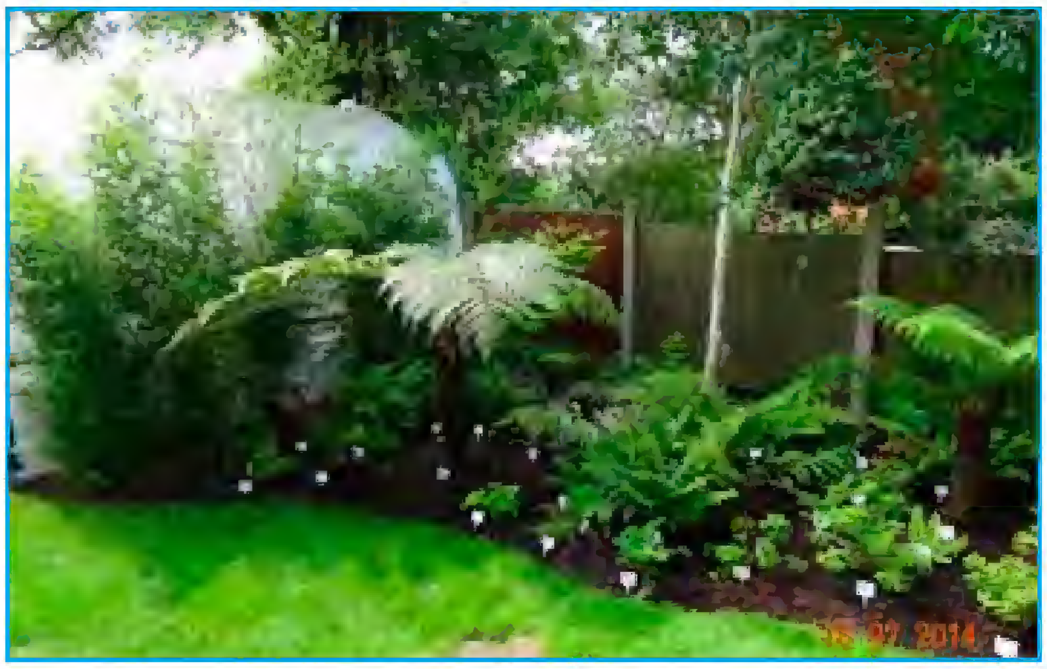

Fig. 31. Another general view of Steve's garden showing the huge range of ferns that he has amassed over the last few years

My visit only lasted four days. In that time I saw so many amazing ferns that it convinced me that this part of the world deserves the title 'Cultivar Country.' I would like to take this opportunity to thank Alec and Linda for their great hospitality, beautiful garden, wonderful food, and all the time and driving Alec put in to this visit. Thank you both, and all the wonderful people who let this Fernaholic into their gardens. I will never forget you.

It was so gratifying to find that cultivars are being encouraged and grown so well in this part of Britain. Long may it be so. Future fern growers can only benefit from these people looking after our heritage.

In 2016 the BPS celebrates it's 125th year anniversary. Alec and many other BPS members have organised an amazing schedule for a national meet at the birthplace of our Society where you can see many of these ferns and more. Clear your diaries for 2nd - 9th July 2016. ❒

Acknowledgements

I would like to thank Peter Campion, Bruce Brown and Alec Greening for the extra pictures.

Book Review
The Plant Lovers Guide to Ferns by Richie Steffen and Sue Olsen (2015)

pp 252, 230 x 205 mm, 165 colour photographs

Published by Timber Press. ISBN: 978-1-60469-474-1. US$24.95 €24 £17.99

This is a book that is not just for fern lovers but also for those who want to use the rich tapestry of foliage, colour and texture of ferns to great effect in the garden.

Both authors are well known to the Society and together they have produced a book that not only encourages gardeners to grow more ferns but also to use them as an integrated part of garden design.

Richie Steffen provides a wealth of detail based on his work as the curator of the Elisabeth C. Miller Botanical Garden in Seattle. His design advice concentrates on the basic principles of colour, line, shape, form, texture and size, all of which can be provided by ferns. Richie manages to cover a vast range of horticultural environments from woodland, rock gardens, wetland, formal gardens, stumperies and even fern tables, one of his specialities.

We learn that formal gardens can benefit from ferns by adding an air of elegance and softening the formal style (Fig. 2). Ferns used in rock gardens might come as a surprise to many designers, but we are shown that dwarf and compact cultivars can be easy to grow and advice is given on alpine and xeric ferns.

A significant part of the section on design covers the use of companion plants for ferns. Richie states that "One of the first rules of combining plants with ferns is that foliage and form override flowers" Sound advice. As well as recommending specific plants which combine well with ferns, he also invites the reader to consider broader aspects of potential companions, such as leaf shape, or the use of ephemeral plants which can fill the seasonal gap before the new fronds appear. His suggestions include old favourites such as hostas as well as lesser known companions such as *Beesia deltophylla,* a recent introduction from China (Fig. 3).

Using lavish photographs, taken by both authors, his design points are superbly illustrated from gardens that are both in the U.S.A. and Britain. In fact the list of owners whose gardens were used reads almost like a "who's who" of the Society.

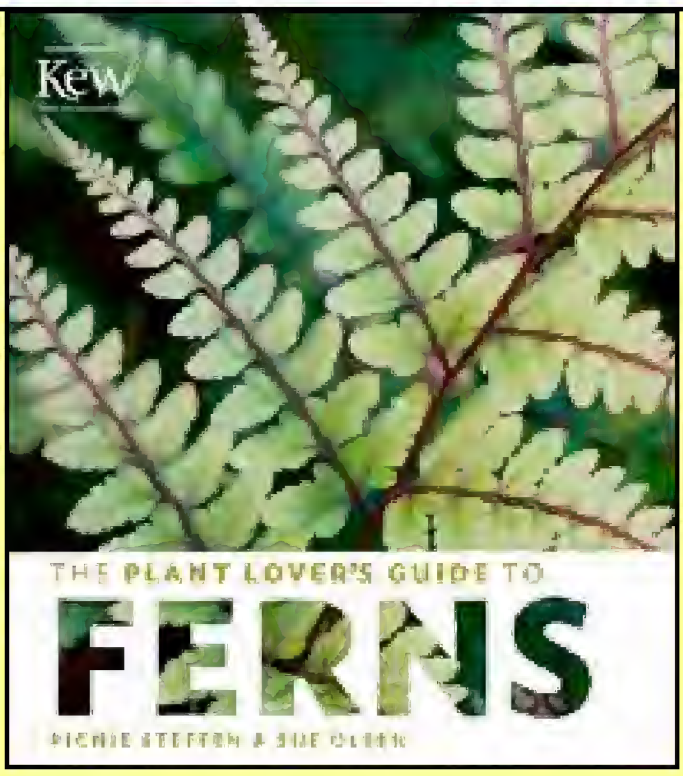

Fig. 1. The cover of *The Plant Lovers Guide to Ferns* featuring that beautiful fern *Athyrium otophorum*

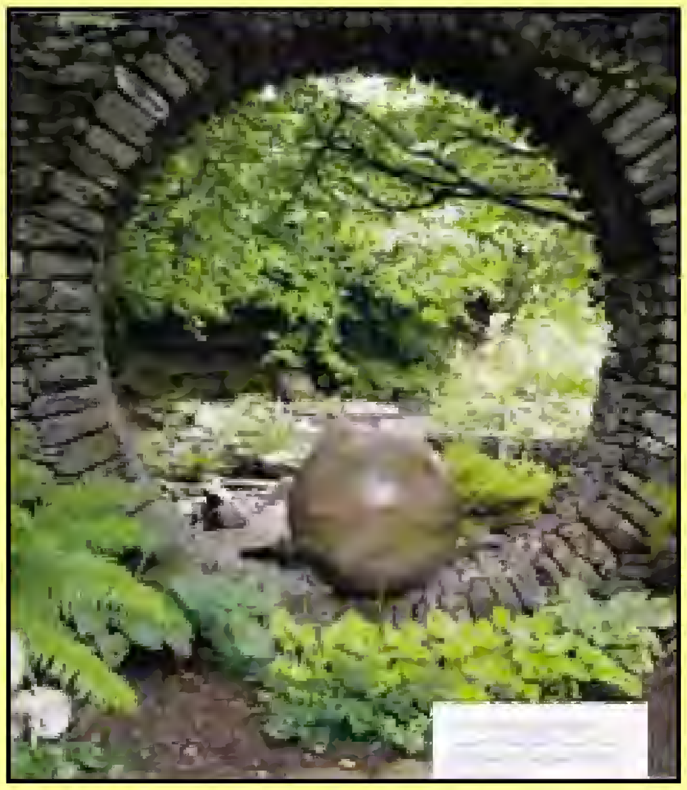

Fig. 2. Ferns and other native plants at Moon Window, built of local stone, in the Caher Bridge Garden, County Clare, Ireland. An example of ferns softening a formal style.

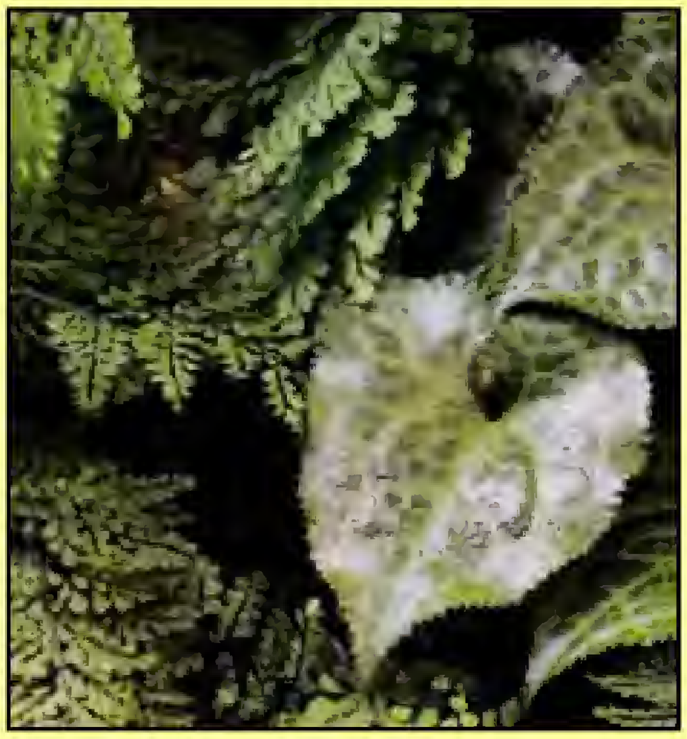

Fig. 3. *Beesia deltophylla*, a member of the buttercup family, acting as a companion plant to *Adiantum venustum*. This plant is often called *B. calthifolia* as there is some doubt as to it's identity.

For the newcomer or less experienced fern enthusiast, the chapter entitled "Understanding Ferns" provides a useful introduction to the parts of a fern, along with lucid explanations of the terms used to describe leaf and plant forms, as well as a brief section on the distinguishing characteristics of the main genera.

Sue Olsen has been involved with ferns for more than four decades and is the owner of a fern nursery, Foliage Gardens, that has introduced numerous ferns to horticulture. Given this experience I am not surprised that she has concentrated on the section entitled "140 ferns for the garden." However, if we include the cultivars that are also mentioned, there are over 200 ferns listed. The majority of them are suitable for hardiness zones 5 - 8, although some require protection. This makes her recommendations a worthy target for fern growers in this country.

Her selection includes old favourites as well as some relatively new introductions, such as *Dryopteris koidzumiana,* which looks very attractive. I might even be tempted to try and grow one of the felt fern species (*Pyrrosia*) in a pot, so that it can be overwintered in the greenhouse.

For me, the real benefit of this part of the book is that Sue draws on her wealth of growing experience and goes beyond the usual, straightforward descriptions. Each entry contains a short paragraph on garden and design uses, which helps the reader decide whether the fern that looks so attractive in the photo would really be the right fern in the right place.

The book concludes with a section on growing and propagation, which includes a note on Japanese holly fern mottle virus that has been recently identified.

Designers will welcome this book and fern lovers who have collections might just be tempted to grow things other than ferns in their gardens. Fern widows (and widowers) now have the ammunition to make the garden more appealing.

I would certainly recommend this book to any fern lover.

Alec Greening

A new national Pillwort Survey

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Some thirty years ago the late Clive Jermy initiated a project involving BPS and BSBI members in producing an up to date survey of Pillwort (*Pilularia globulifera*) in the British Isles. This species, endemic to Europe, is widely distributed, primarily in the west but extending very locally eastwards to Finland, Poland, Czechoslovakia and S.E. Italy. Because of its particular habitat requirements it has proven vulnerable to changes in agriculture and land use and has undergone a considerable decline in abundance although this has not proven easy to capture or record at this continental scale. Even in the British Isles, which may be seen as its hot-spot there was evidence of its decline and this was undoubtedly one of the driving forces behind the original survey. The work was carried out over several years and in its later stages actively taken up by Plantlife, the then recently formed plant conservation charity. The mammoth body of work captured has sadly never been made fully accessible.

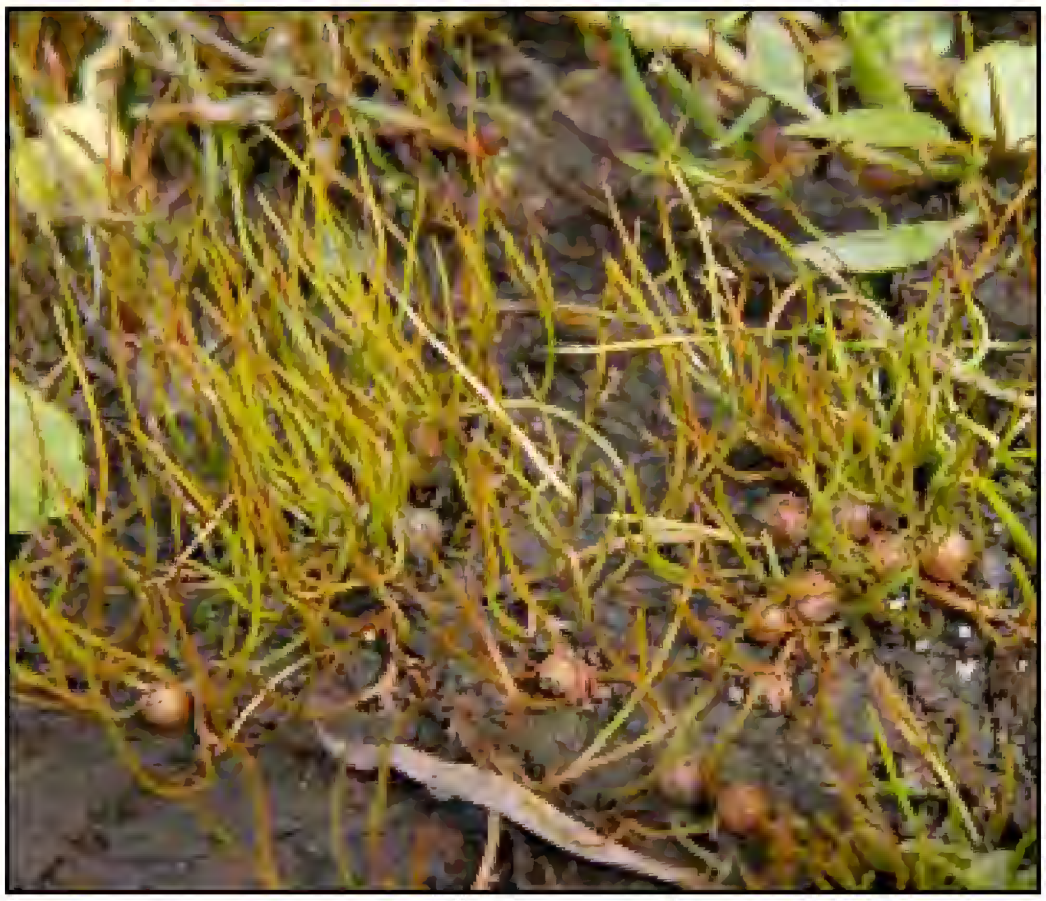

Fig. 1. This fertile material is from N. of Holmsley Lodge, New Forest (SU29, 02) May 2011

When compiling the UK Red Data List (Cheffings *et al.*, 2005) the species was listed as NT – near threatened, subsequently the England List (Stroh *et al.,* 2014) has increased its threat rating to VU – vulnerable, and given that the species was most abundant in England this is significant and all the more so given the perceived threat to the species elsewhere in Europe and hence globally.

Following recent discussions at the Aquatic Plant Taxon Group meeting it was felt that now would be timely to revisit *Pilularia* in the British Isles with the sad recent demise of the architect of the earlier work and 30 years on from its inception.

I am in the process of trying to solicit funds to set up a small workshop to discuss what information we need to capture, how we can build on the data from the earlier survey and the best means of finally publishing the combined data-set. In the meantime I wanted to alert the membership to the fact that a re-survey was planned.

In many cases there are no records for sites subsequent to the past survey.

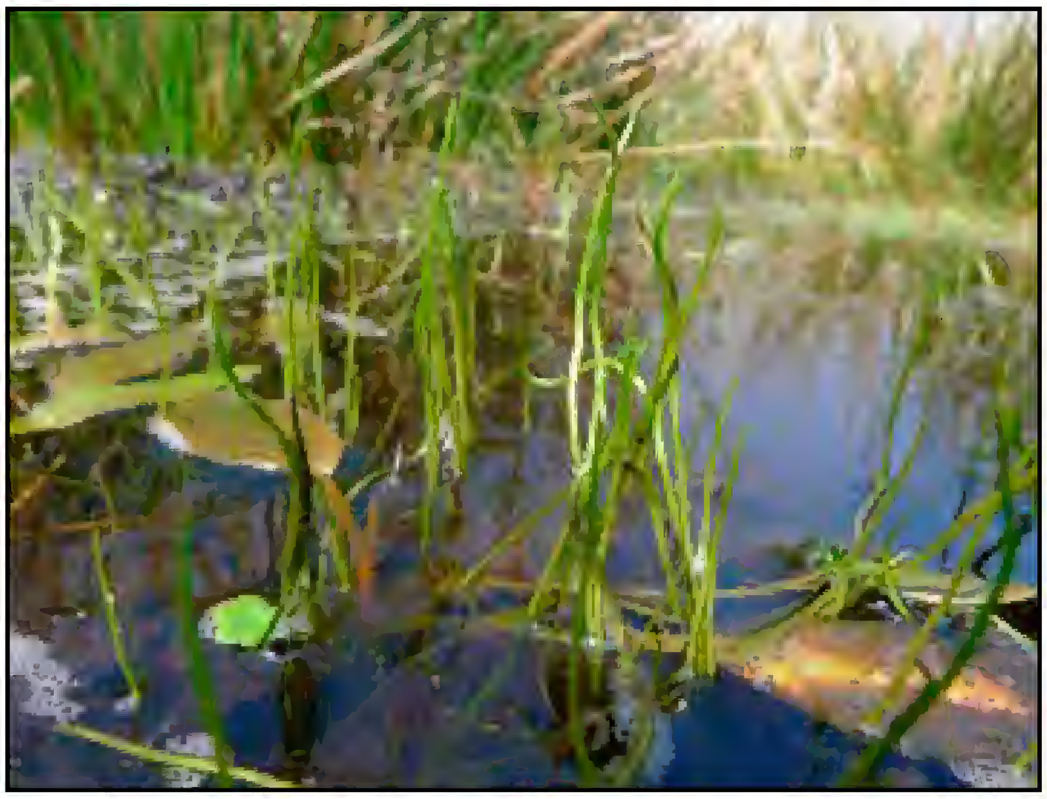

Fig. 2. *Pilularia* north of Sychnant Pass, Caerns (SH75, 77) May 2012

It is my intention to persuade people to adopt sites, whether their nearest, or others they may visit or know well to do some simple but meaningful recording. Our biggest challenge lies in the New Forest – the epicentre of its distribution and probably the richest meta-population of the species in the world. Getting to grips with it here will be challenging but essential for our understanding.

I hope that some of our regional recording groups will rise to the challenge and target local sites over the next few years. If people want to contact me to find out where their nearest historical sites are I will happily furnish maps and what data is available for particular sites should they wish to become involved

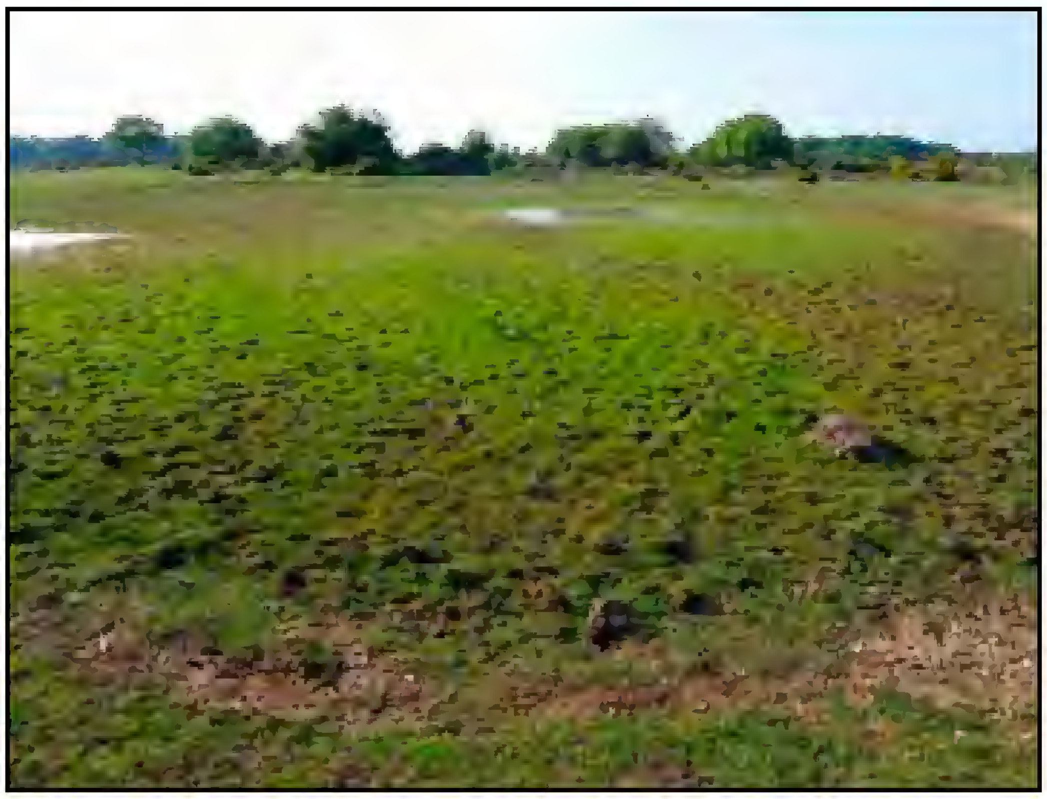

Fig. 3. Habitat, Ocknell plain, New Forest (SU23, 11) May 2013
[all of the bright green in the dried down pond is *Pilularia*]

Asplenium x *tagananaense*, a remarkable hybrid from Tenerife

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The hybrid between *Asplenium hemionitis* and *A. onopteris* has been found only once. A single plant was discovered on the island of Tenerife in 2009 and was described and named as *A.* x *tagananaense.* The name is derived from the village of Taganana in the Anaga region of Tenerife, near to where the hybrid was found. A group of keen amateur pteridologists, comprising Andrew Leonard, Martin Rickard, Alison Evans, Michael Haywood and myself, made the original find in February 2009. It was growing on steep soil bank alongside a trail leading to Taganana. I recall that initially I was not convinced it was a hybrid and could be an aberrant form of *A. hemionitis;* however the other members of the team were more open to the possibility that it was a cross. Following examination of a couple of voucher fronds by Fred Rumsey at the Natural History Museum the hybrid nature of the plant was established and publication of the find ensued (Rumsey & Leonard 2011).

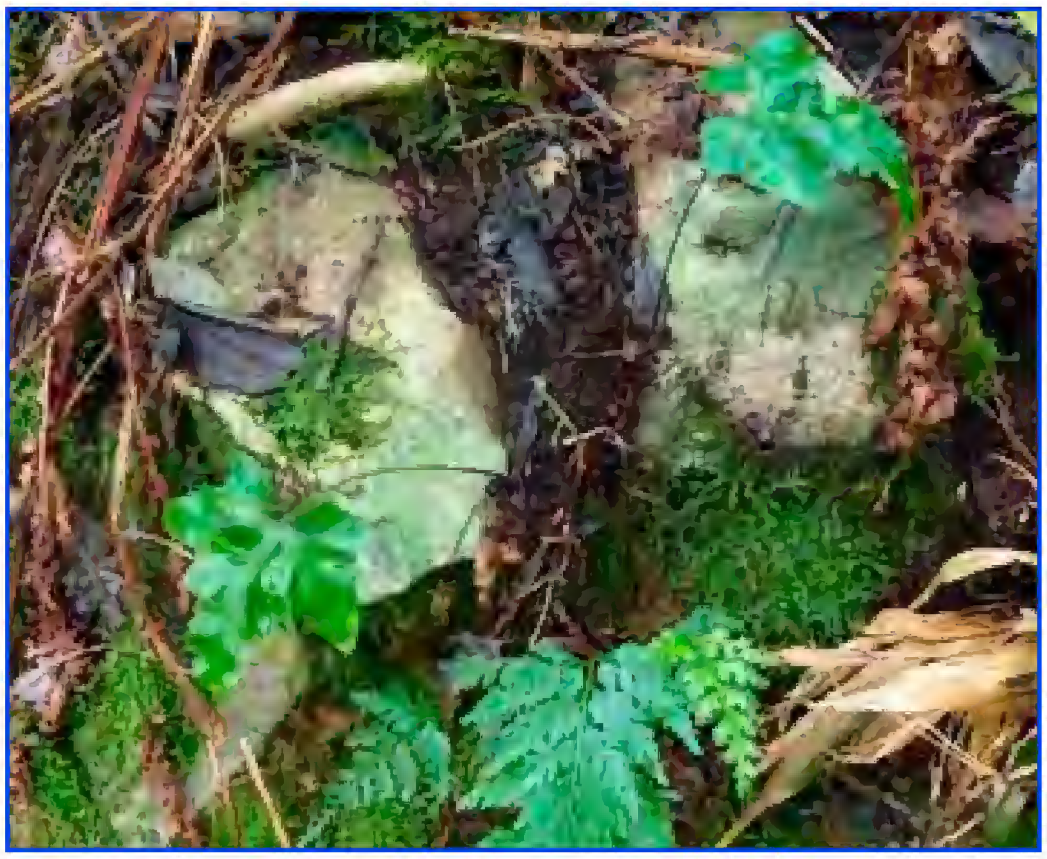

Fig. 1. *Asplenium* x *tagananaense* photographed 2nd February 2015

The two parents are completely different in frond form. *A. onopteris* has fronds that are tri-pinnate whereas those of *A. hemionitis* are heart-shaped or with 3-5 palmately arranged lobes. The hybrid plant resembles the *A. hemionitis* parent more closely than *A. onopteris* in overall frond shape. The lobes, particularly the central one, are conspicuously pinnately lobed. When first discovered the single plant had about seven fronds but recent visitors had reported that the plant was in decline. So it was with some expectation of failure that I re-visited the site in February 2015. However I am pleased to report that the plant is still alive although rather less vigorous than before. Two fully formed fronds were present and an unfurling crozier was also evident.

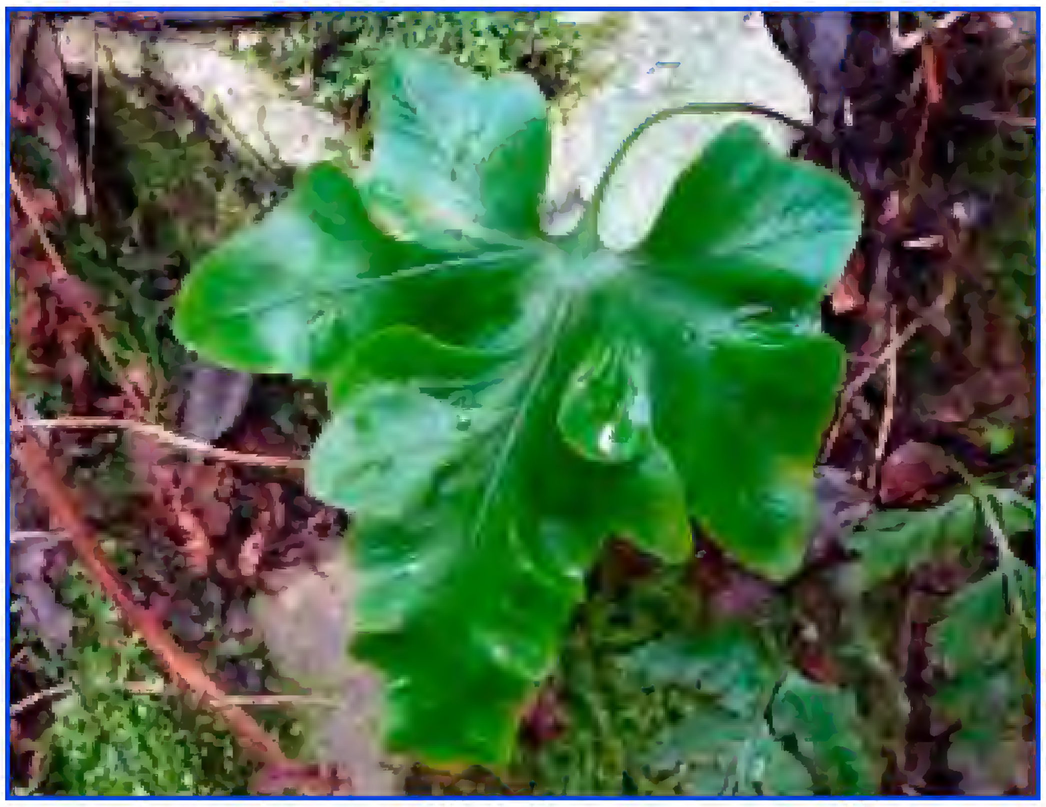

Fig. 2. *A.* x *tagananaense* frond upper side

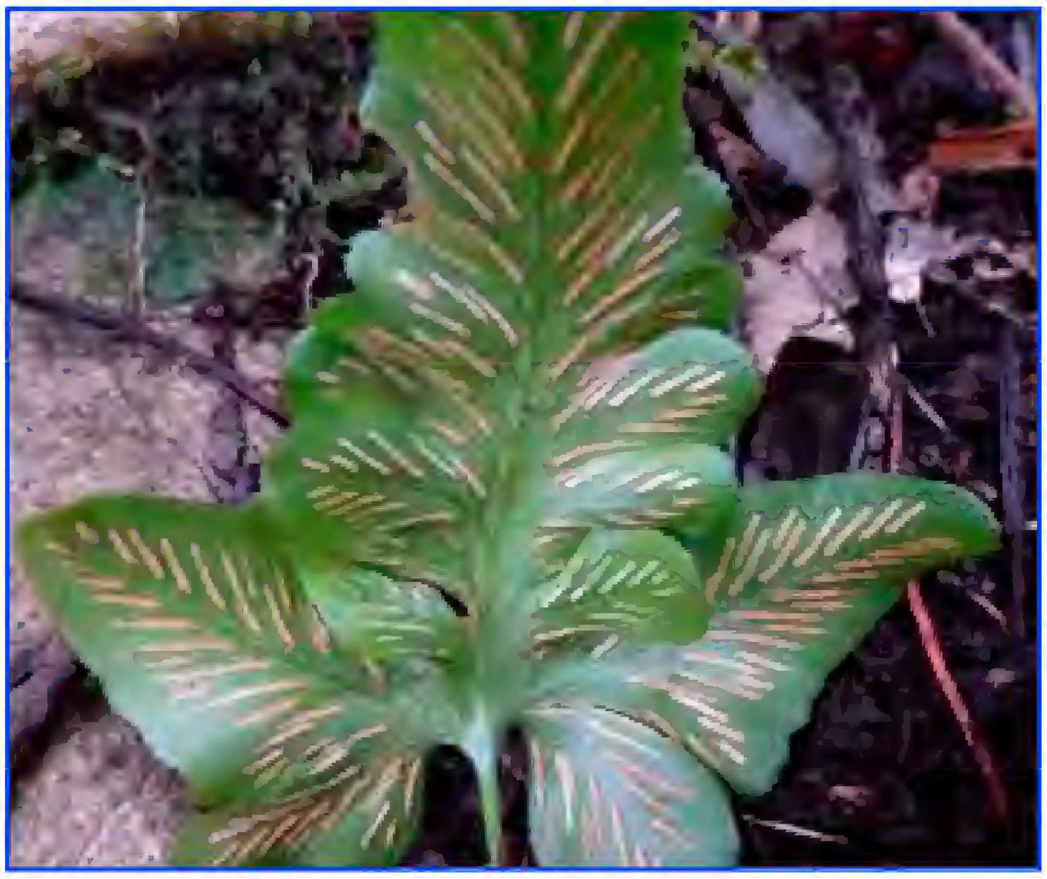

Fig. 3. *A.* x *tagananaense* frond underside

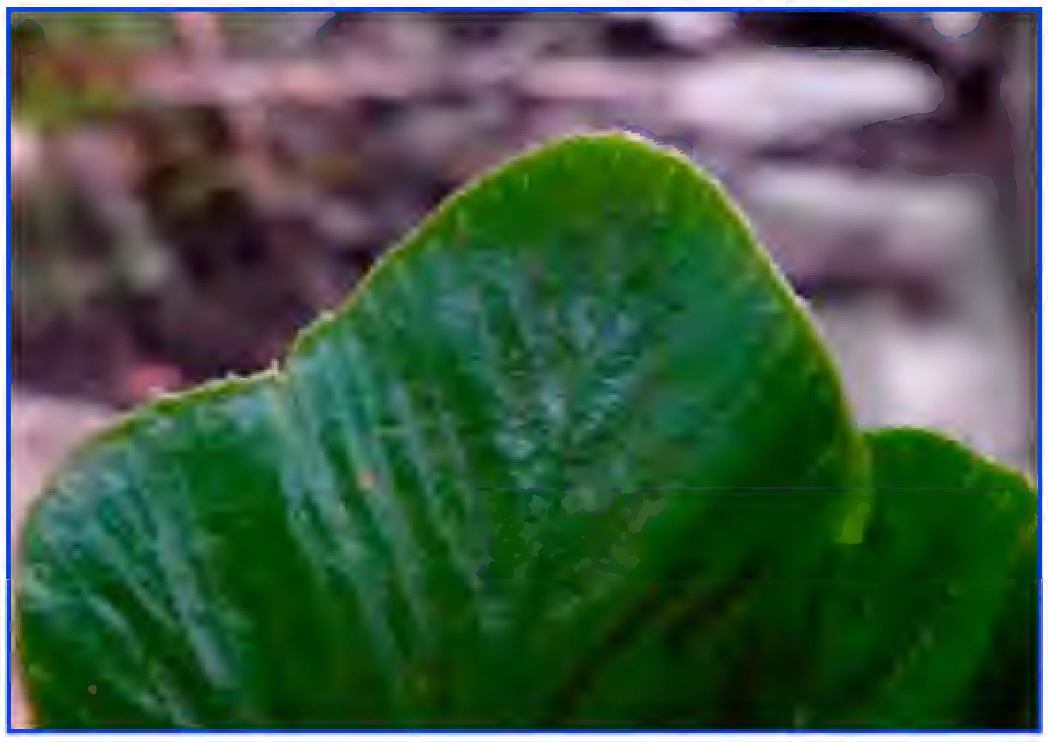

Fig. 4. *A.* x *tagananaense,* close up of marginal teeth on frond lobe

I took the opportunity to study the fronds closely as I was interested to see if there were any previously overlooked characters that would further indicate the role of *A. onopteris* in its parentage. One small but fairly conspicuous character was discernable that, although briefly mentioned in the original description, was not emphasised.

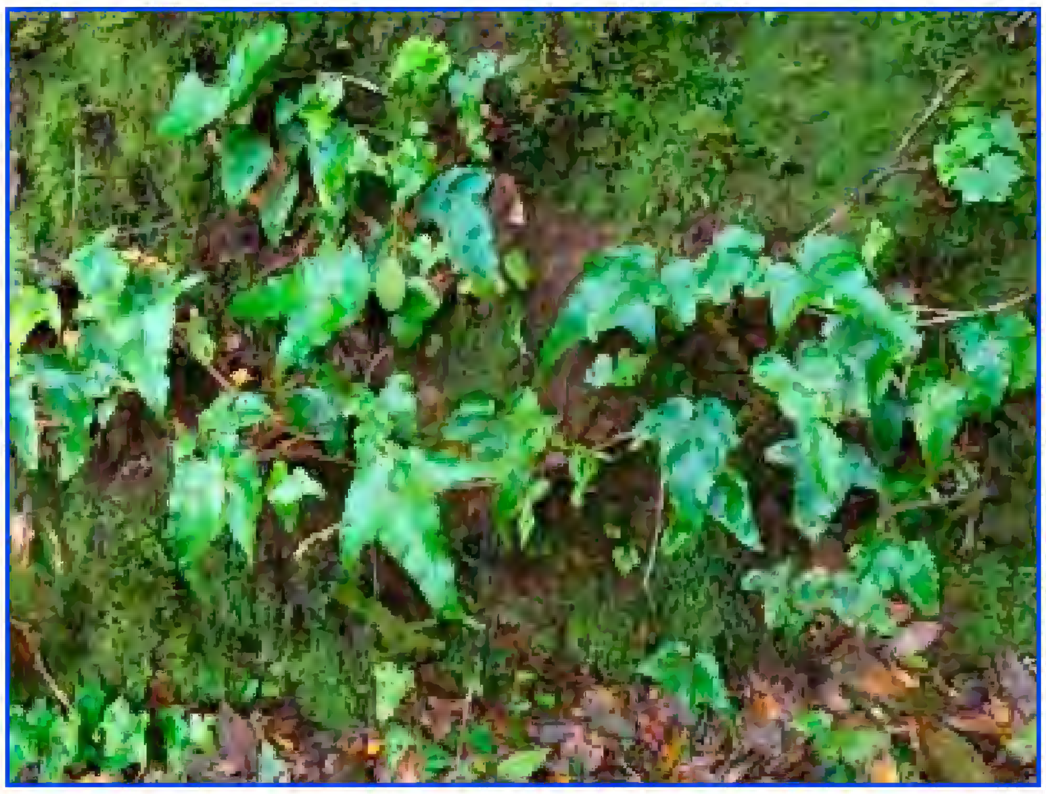

Fig. 5. *Asplenium hemionitis* on trackside bank

The fronds of *A.* x *tagananaense* have narrow cartilaginous margins similar to those found in *A. hemionitis.* In the latter species the margins are entire, however in the hybrid the margin is finely toothed, the teeth being erect and sharply pointed. I examined many fronds of *A. hemionitis* and found occasional teeth on basal lobes but they were short, blunt or rounded. In *A. onopteris* the cartilaginous margin is so narrow that it is almost undetectable with a hand lens and appears to be untoothed. It is possible that the teeth are a morphological expression of some *A. onopteris* genes in the hybrid. Unless further hybrids are found it is not possible to know if the tooth character is constant. As on previous visits, a thorough search of the area did not reveal any more hybrid plants, although both parents are frequent and are often growing intermixed - this suggests that A. x tagananaense is a hybrid of very rare occurrence. The single existing plant will probably not survive for many more seasons so any further discoveries will be of immense interest.

The Taganana Trail

The trail leading to Taganana, where the single plant of *A.* x *tagananaense* occurs, starts at the Casa Forestal (Forestry Station) located on main road (TF12) west of El Bailadero. It is one of my favourite walks in Tenerife, with a wide range of ferns that can reach perfection in the humid climate.

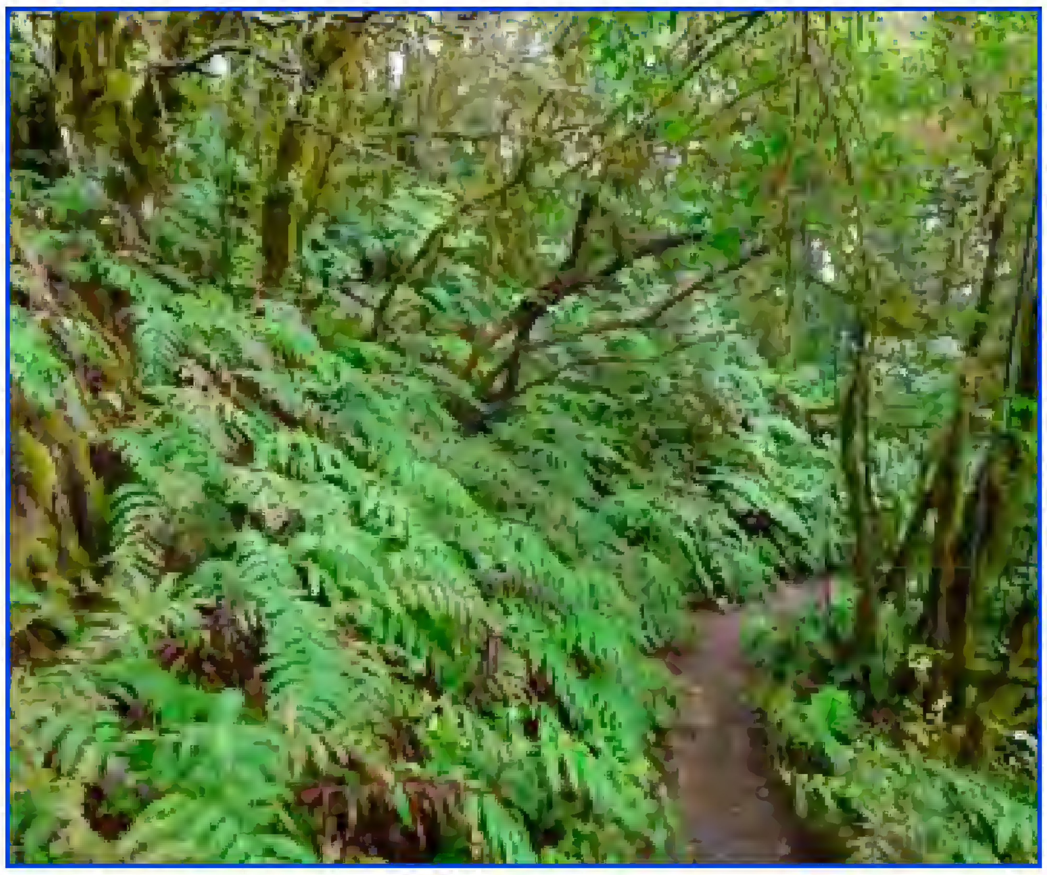

Fig. 7. *Woodwardia radicans*. Typical habitat

Rainfall is high, and when not raining the mountains are frequently shrouded in low clouds and mist, providing ideal conditions for ferns. The trail starts with a short upwards climb under tree heather (*Erica scoparia*)

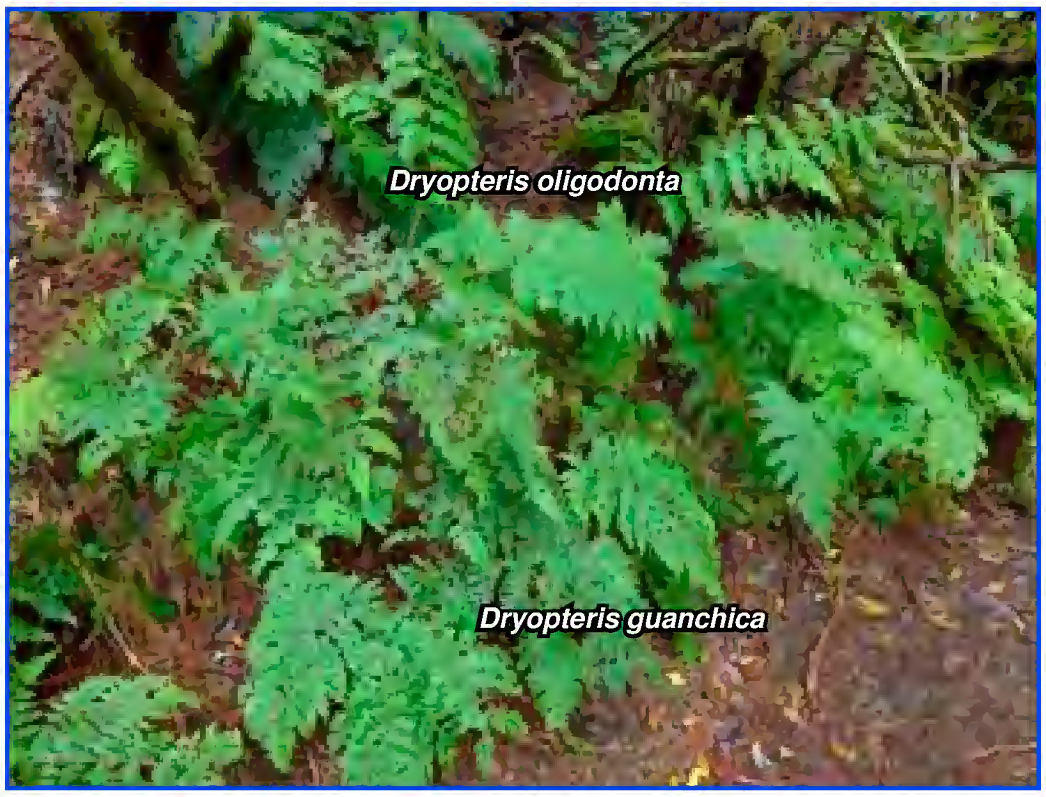

Fig. 6. *Dryopteris oligodonta* and *D. guanchica* growing intermixed

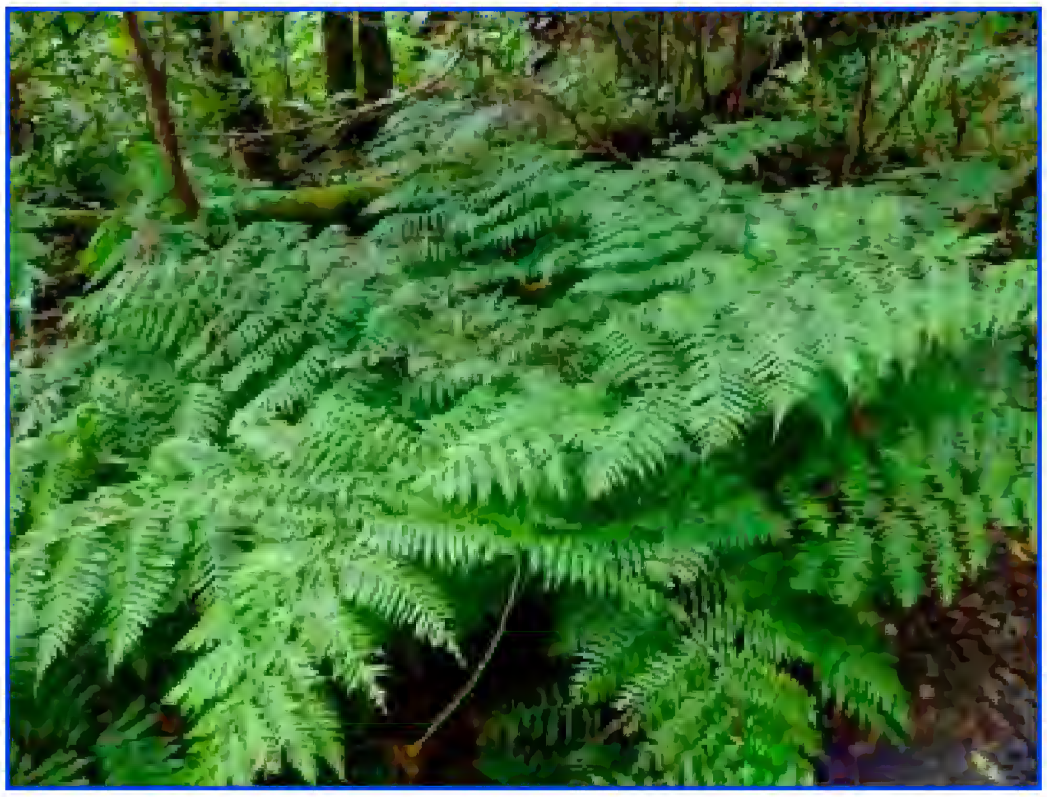

Fig. 8. *Diplazium caudatum* growing in wet springline

before plunging downwards into the shady laurel forest composed mainly of *Laurus azorica*. The very handsome *Dryopteris oligodonta* is abundant along the trail and can reach a majestic size with fronds commonly exceeding 1.5 metres. This species is only found in the Canarian and Cape Verde archipelagos. In the upper part of the trail it is accompanied by *D. guanchica* and the two species can be easily compared. *D. guanchica* is smaller than *D. oligodonta* with fronds 2-3 pinnate and upturned marginal teeth giving a crispy appearance.

Also in this upper section *Blechnum spicant* is frequent, but both this and *D. guanchica* gradually disappear as the trail descends, and *Asplenium hemionitis* starts to appear. *Woodwardia radicans* is also abundant throughout the walk and fronds commonly exceed 2 metres in length, sometimes approaching 3 metres from base of stipe to frond tip. Large, spectacular colonies form on the steep hillsides as the buds at the frond apex root when they reach the ground and grow into new plants. Sporelings are often seen on steep soil banks alongside the path. Large plants of *Polystichum setiferum* are frequent, looking rather different from British forms. *Asplenium onopteris* occurs all along the path and the epiphytes *Davallia canariensis* and *Polypodium macaronesicum* occur on both trees and banks.

The very attractive *Diplazium caudatum* is frequent lower down the trail. The stipes and rachis are very dark and contrast well with the finely divided glossy fronds. Large plants occur where water seeps out from the slopes. In a couple of places I saw *Pteris incompleta,* a more local fern. One plant in particular was huge, with some fronds reaching 2 metres in length. This species superficially resembles *Woodwardia* and can be overlooked; however the sori are very different. Throughout the trail Bracken (*Pteridium aquilinum*) is present. Despite the southern location the plants are totally deciduous and in February new fronds are just starting to appear. The spike-moss *Selaginella denticulata* is frequent on the path banks and lower down, near where the path emerges from the forest, the extraordinary *Adiantum reniforme* can be seen on rocky banks. The fronds in this species are reduced to a single orbicular pinna. I find it fascinating that this simple frond form has evolved several times in other not-closely fern genera.

Other interesting plants of the laurel forest include the beautiful Canary Bellflower (*Canarina canariensis*), a fleshy scrambler with orange, strongly veined, pendulous flowers that almost glow against the dark forest background. Another common climber, *Semele androgyna*, is a close relative of our Butchers Broom (*Ruscus*). The apparent leaves are in reality flattened stems or cladodes. The flowers are born around the cladode margins and in February orange berries fringe the cladodes. Plants are often very robust and climb high into the laurel trees.

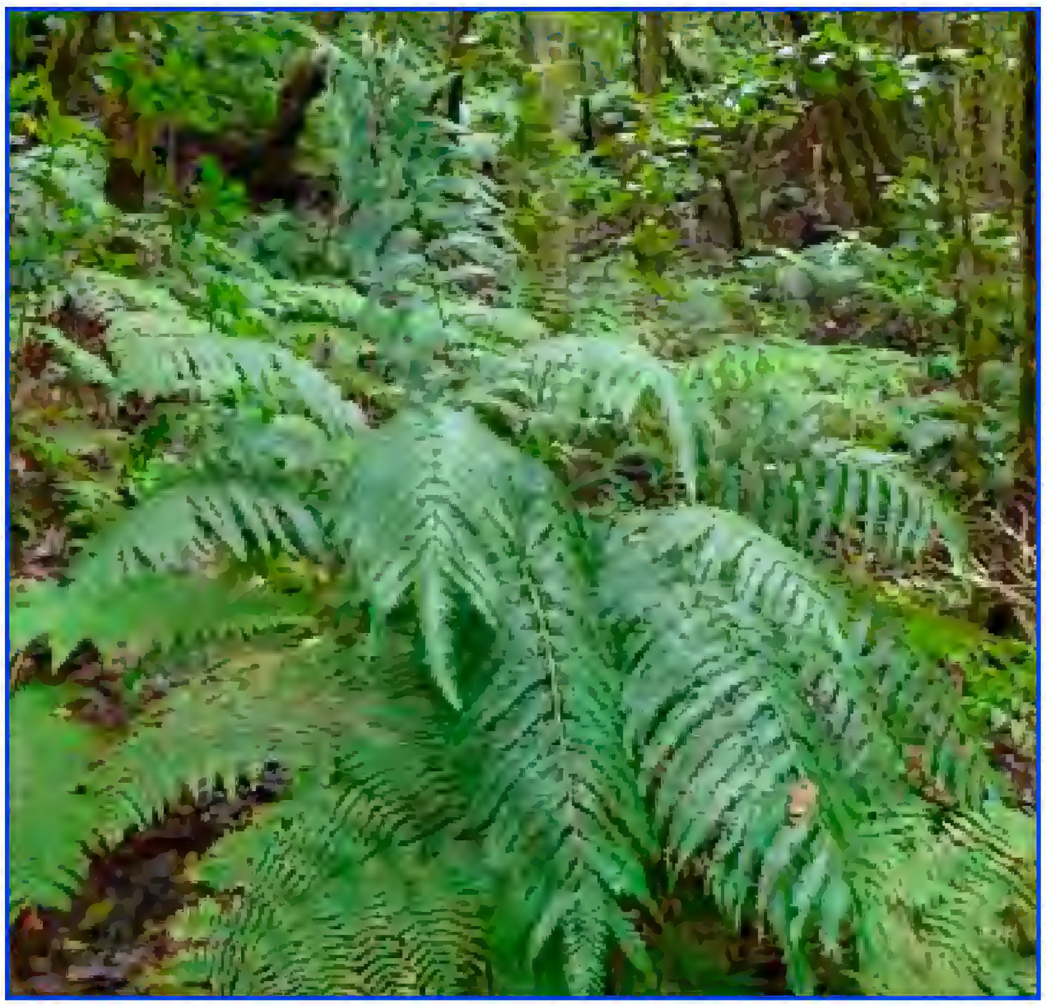

Fig. 9. Huge plant of *Pteris incompleta*

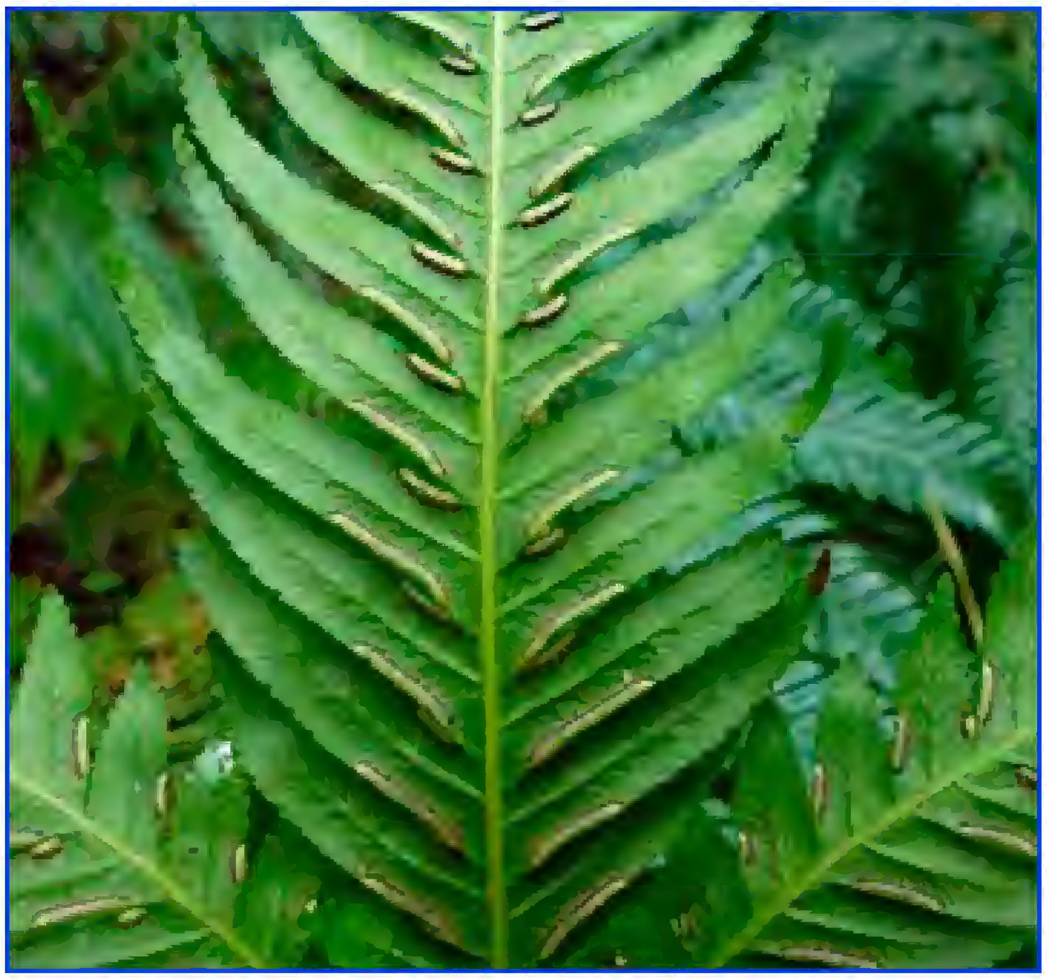

Fig. 10. *Pteris incompleta* sori

If you are ever holidaying in Tenerife I can highly recommend a trip to Anaga. There are many well sign posted trails and paths, so try leaving the road and dive into a world of marvellous ferns. ❐

References

Rumsey, F.J. & Leonard, A. (2011 ('2010')) *Two novel Asplenium hybrids (Aspleniaceae; Pteridophyta) from Tenerife, Canary Islands,* Fern Gaz. Vol. 18 Pt 8 pp. 342-350

The world's oldest fern book

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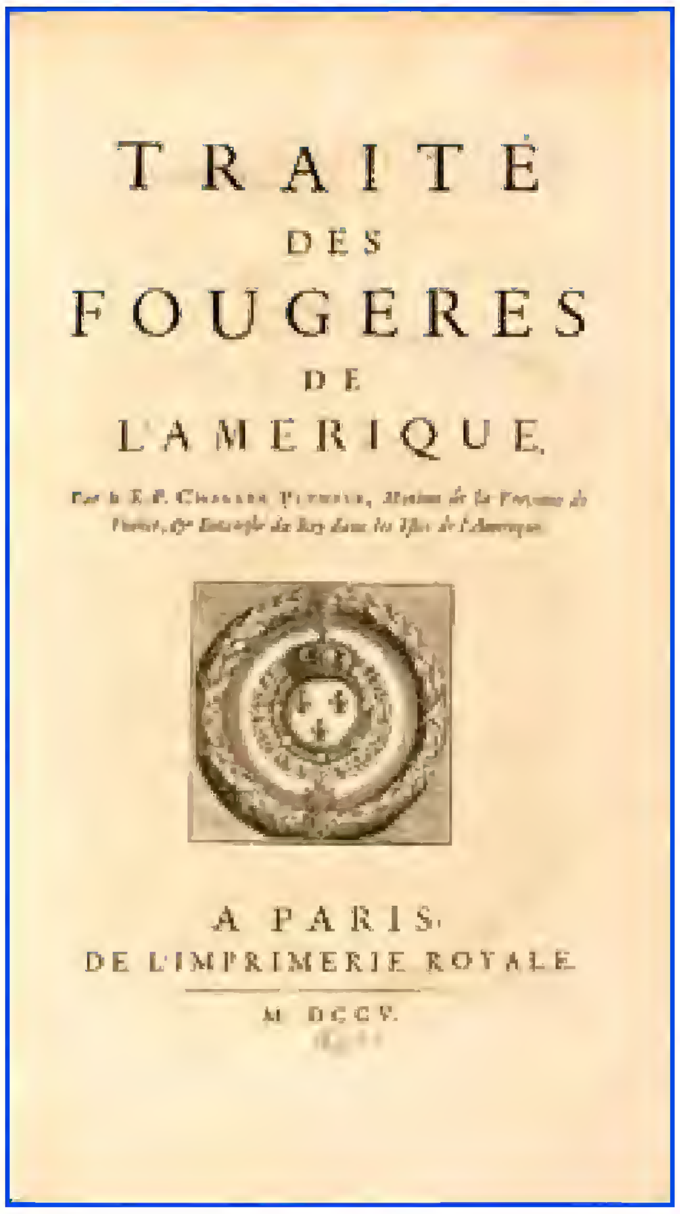
Ferns were frequently mentioned in old herbals and floras - see John Edgington`s book *Who found our ferns* - but how many of these mentions referred to real illustrated fern books? That is books about ferns only, not pamphlets, but books, not volume one of a larger flora including ferns, but ferns only.

Looking into this subject I found it easy to establish Bolton`s *Filices Britannicae* published in 1785 as the earliest British book, but the mass of foreign, mainly European literature is an unknown area to me. I decided to look into it. Surprisingly I have only found one specialist fern book which pre-dates Bolton. After Bolton, many technical specialist books, mainly concerned with classification of the ferns, were published in mainland Europe before 1831, when the next British book was published. That was *Icones filicum* by Hooker and Greville. In sequence the intervening books I am aware of are:

1801 *Genera et species filicum*, by Swartz
1803 *Filicum genera et species...*, by Hedwig
1804 *...kryptogamische gewasche*, by Sprengel
1806 *Synopsis filicum*, by Swartz.
1809 *Linneischen pflanzensystems oder kryptogamische gewasche*, by Schkuhr,
1811 *Observations sur quelques nouveaux genres de fougeres*, by Desvaux
1824 *Enumeratio filicum*, by Kaulfuss.
1825 *Plantarum Brasiliensum*, by Raddi.
1827/30 *Enumeratio Javae Fasciculus II*, by Blume
1829 *Flora Javae*, by Blume

I have abbreviated the titles of many of these books because long rambling titles would probably mean little. Some of these are not strictly stand alone fern books; e.g. Blume`s *Flora Javae* features ferns very heavily but not exclusively. In this intervening period there were several other major publications, but those I have seen referenced are parts of journals or wider volumes, so I have not listed them above. I have not seen many of these books; some are almost certainly not illustrated.

Strangely, prior to Bolton`s *Filices Britannicae* there appears to have been only one fern book published. Remarkably it does not cover Europe, although it was written by a European, a Frenchman, Charles Plumier (1646 – 1704). Most surprisingly it covers America, or rather part of America – the French West Indies! It is titled *Traité des fougères de l`Amerique*. Some BPS members saw this book at the Botanical Research Institute of Texas (BRIT) and no doubt at the Natural History Museum, London.



TRAITÉ
DES
FOUGERES
DE
L'AMERIQUE.

A PARIS.
DE L'IMPRIMERIE ROYALE.
M. DCCV.

Fig.1. Title page of *Traite des fougeres de l`Amerique*.1705

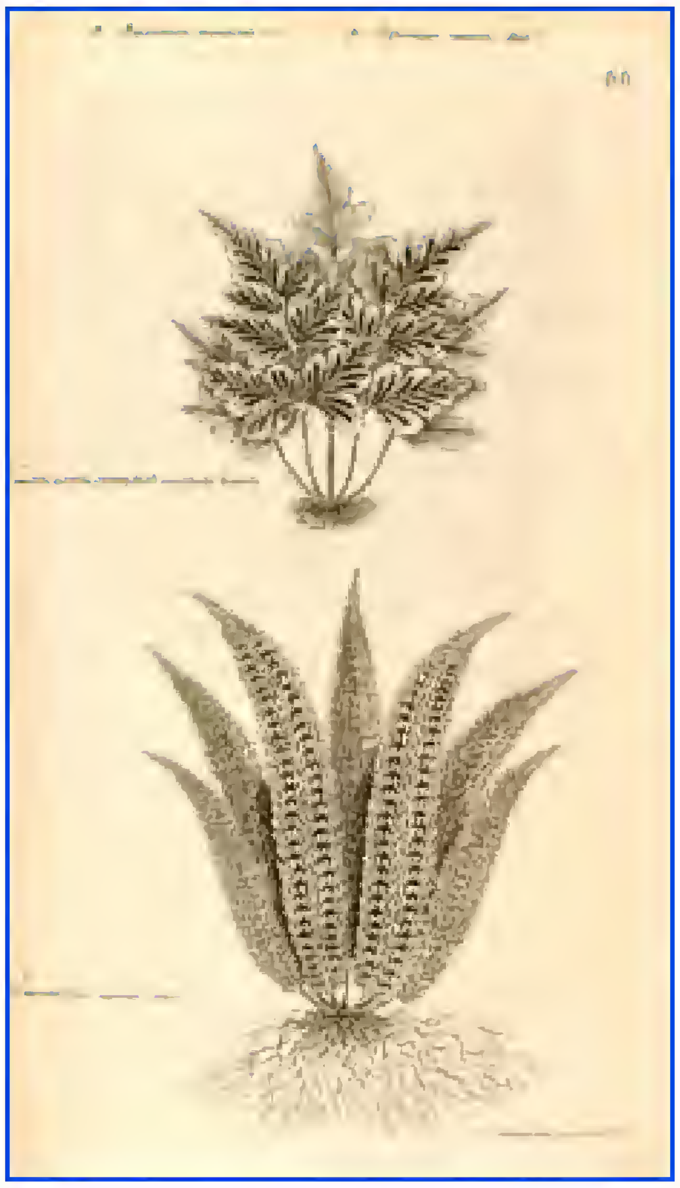


Fig. 2. Sample plate, Plate No.66. Top *Asplenium pumilum*, bottom *Asplenium nanum*.

It was published in Paris in 1705, a year after Plumier`s death. It is folio (16 x 10.8 inches), 194 pp. and 172 full page uncoloured plates drawn by Plumier, many drawn during the 1690s. The plates are generally very good, if a little stylised as in contemporary herbals. Nomenclature is pre-Linnaeus so not easily recognisable. The copy available free on-line from Strasbourg University has helpfully been annotated with more modern binomial names on most plates.

It is not a particularly rare book, but it is expensive, with most copies in institutions! COPAC (National, Academic and Specialist Library Catalogue) lists ten copies in major British libraries, but there must be similar, or larger, numbers in France and the USA. The original print run must have been large for all these copies to have survived; an amazing achievement in 1705. The copies I have seen are all perfectly printed, no smudges and no missed sections. I suspect most surviving copies have found their way into museums and libraries. Why are mounted plates very rare? Certainly I have never seen one. Could it be that they are printed on rather thin paper, uncoloured and thus unsuitable for mounting?

I have called this a `fern book'; however there are actually 3 plates towards the end featuring fungi, lichens and algae – why did Plumier have to introduce these few impurities!? The last two plates are curious. After everything else being West Indian these two plates depict seven northern European species, native in the UK.

I believe this to be the first fern book ever published. I would be very pleased to be proved wrong! ❐

(The complete book, with every page, reproduced in high quality at http://docnum.u-strasbg.fr/cdm/ref/collection/coll13/id/58335. The illustrations here are taken from this site.)

Fern Weeds on Hawaii

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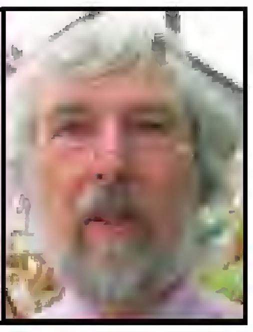

I expect it is our depauperate fern flora but I have from an early age been fascinated by alien ferns within the British flora. Geoffrey Kitchener, the BSBI recorder for Kent mentioned an alien to me about 40 years ago not more than a mile from my home and I simply had to track it down. I think it had been known for 25 years then. This small *Onoclea sensibilis* colony has slowly expanded and split in two since I have been monitoring it. More lately I have been made increasingly more aware that alien ferns are all around us by the findings of Heather McHaffie in Edinburgh and Fred Rumsey and John Edgington in London.

Slowly unharnessing the yoke of work I was able to travel abroad. Almost the first fern I saw on Madeira was *Christella dentata*, a subtropical weed which I have now seen all around the world. This only fuelled my interest and being a fernatic and of a somewhat naughty persuasion quite amused me, when I realised some of these ferns far from being just occasional and a race of plants perhaps doomed to extinction by the angiosperms can be a severe nuisance in parts of the world. I hope to discuss fern weeds at our autumn meeting in Glasgow.

Visiting my son Richard in New Zealand in 2014 I was determined to break the long journey home and spent just three days on Big Island, Hawaii. Palmer (2003)[1] quotes 139 endemic and indigenous species of fern and 30 additional naturalised ferns. With just three days we spent a lot of time looking at *Sadleria* and *Cibotium* around Volcano National Park where we were staying. However on the last day we decided to travel up the North East coast above Hilo. All over the large trees on the sea front at Hilo were plants of *Platycerium bifurcatum.* We had seen a little of this in Russell, New Zealand a fortnight before but nothing to the extent as in Hilo. A native of Australia this fern was only first collected in 1991 growing wild on Maui (Palmer 2003)[1].

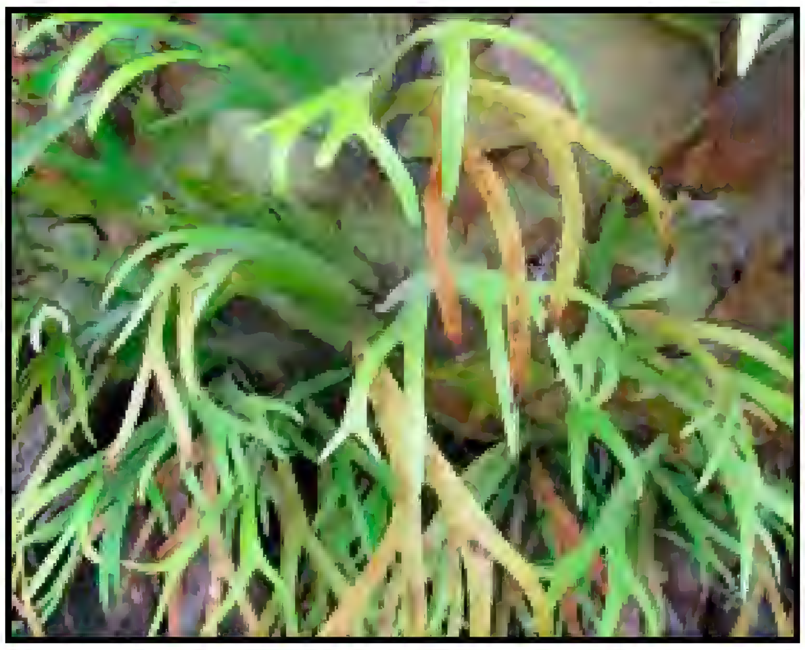

Fig. 1. *Platycerium bifurcatum* on the sea front Russell, New Zealand

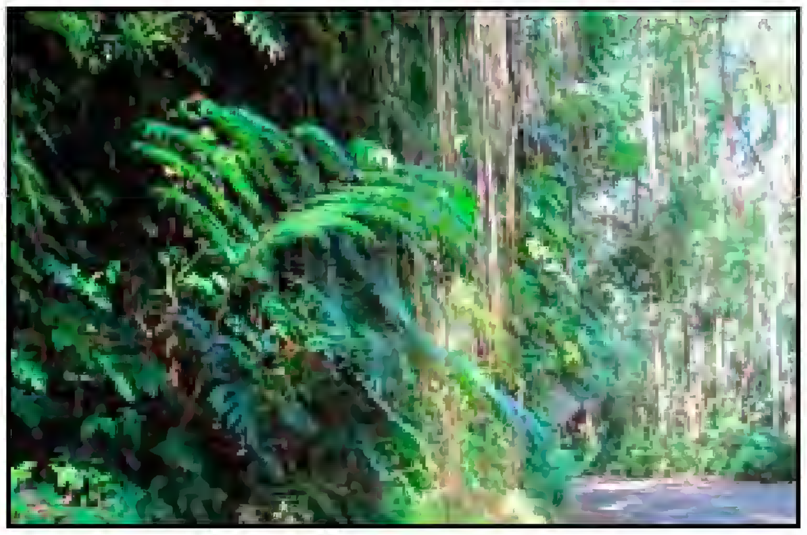

Fig. 2. *Angiopteris evecta* on roadside bank in lane leading into gorge

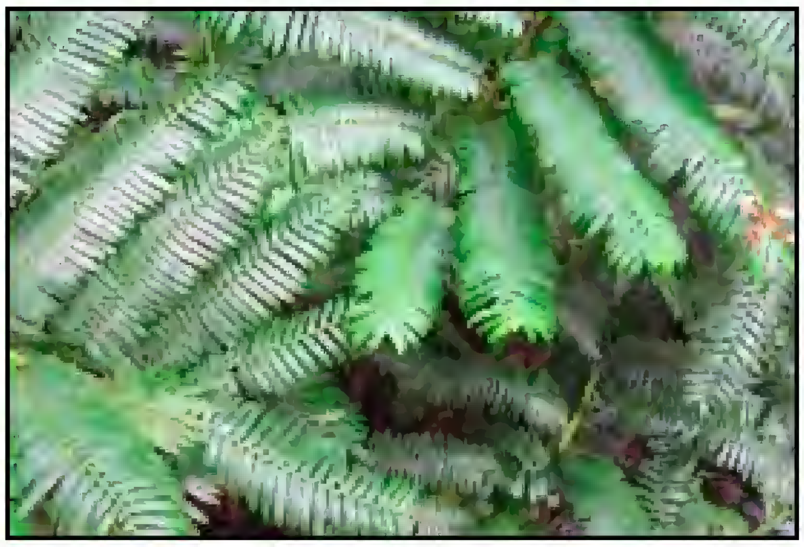

Fig. 3. Looking over the bridge to the 3m fronds of *Angiopteris evecta*

Driving North East above Hilo it was not long before I saw a sign saying 4 mile Scenic Drive. Realising this would be closer to the sea and away from the main road we drove along this old coastal route where there were suddenly more ferns than we had seen on the previous two days. After stopping a couple of times, the road headed down into a very shady gorge and after crossing the bridge we found a tiny place to park and leapt out of the car. At first I thought that the whole gorge was full of *Archeopteris evecta* but soon realised that these huge prehistoric ferns had an understorey of similarly dark green ferns, *Diplazium esculentum.* To see a deep gorge whose sides were so totally covered with these two ferns was one of the highlights of the trip for me. The 3-4m high fronds of the *A. evecta* closely infilled with the 1.5-2m high *D. esculentum* was simply stunning. I guessed that the *D. esculentum* was an alien here and guessed it had been introduced as a green vegetable confirmed by Palmer (2003)[2] but only realised a little later that *A. evecta* only originally stretched eastwards as far as Tahiti from SE Asia. This plant is usually the most common tropical Marattiale that you

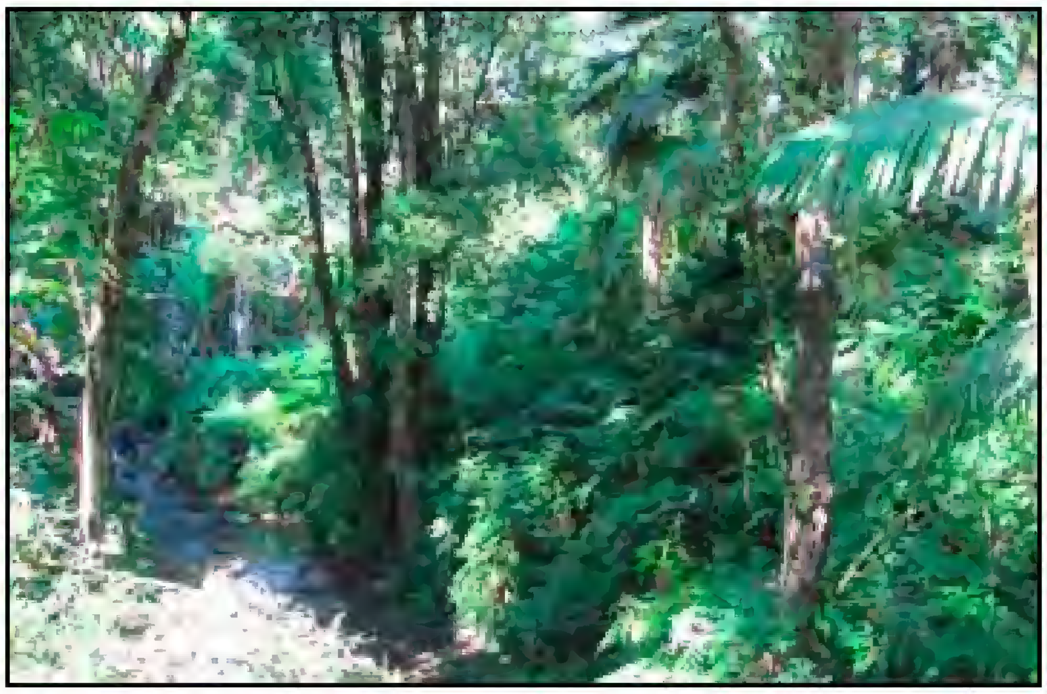

Fig. 4. *Angiopteris evecta* and *Diplazium esculentum* covering the river bank

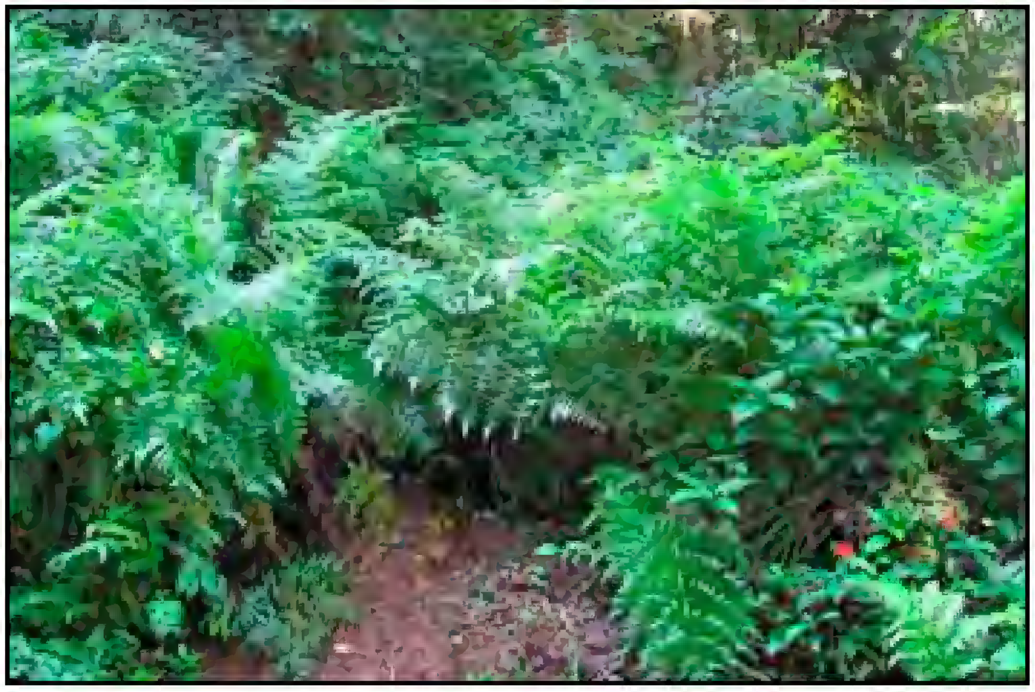

Fig. 5. *Diplazium esculentum* entangle with *Angiopteris evecta* in gorge at road level

Fern Weeds on Hawaii

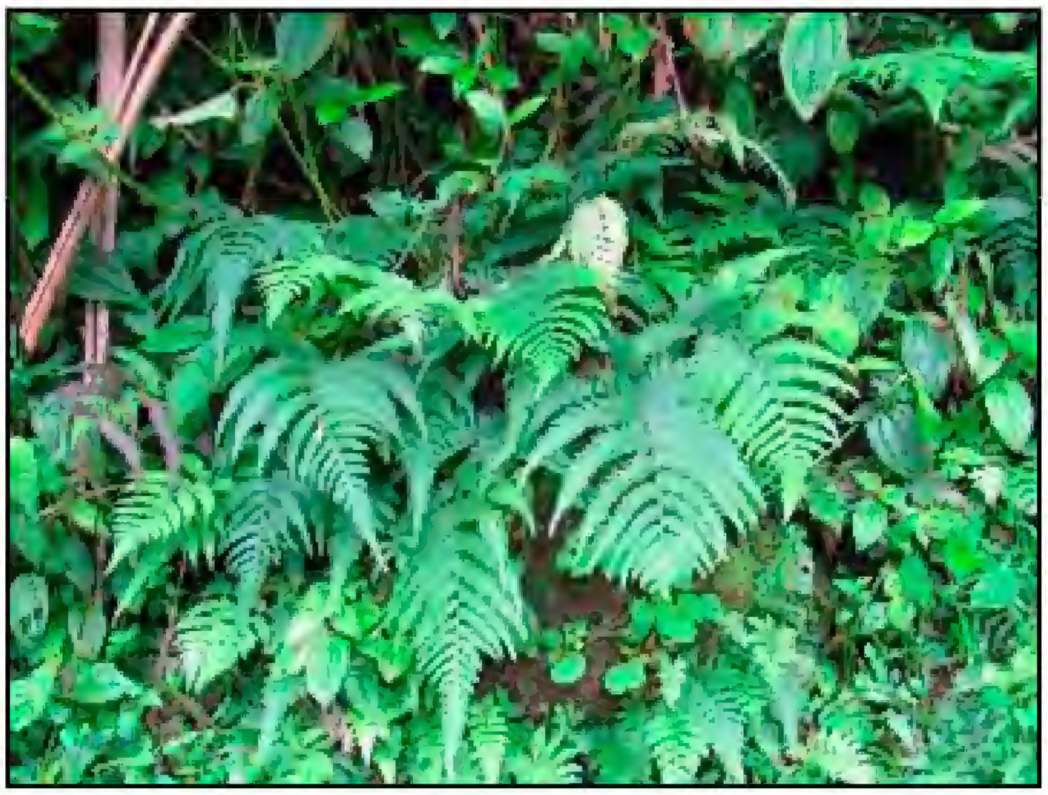

Fig. 6. *Deparia petersenii* colonising strimmed area at Akaka Falls State Park

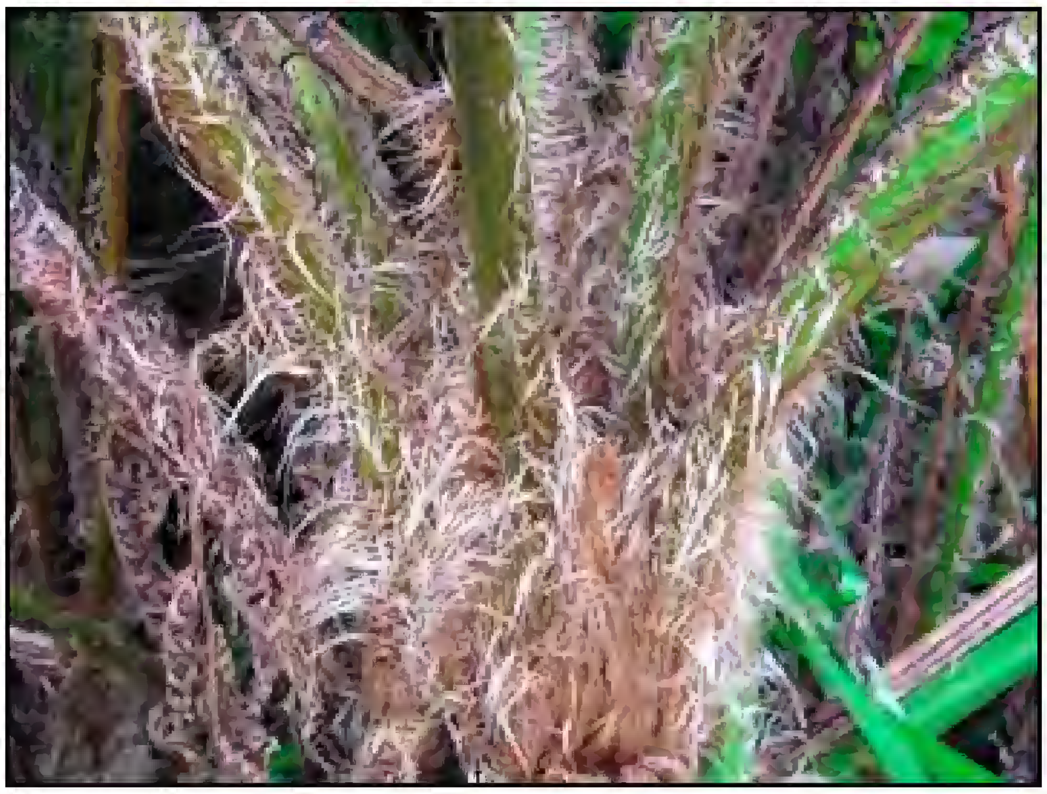

Fig. 7. *Cyathea cooperi* at start of Akaka Falls State Park trail

find in tropical glasshouses such as Kew. Apparently Captain Bligh (Mehltreter et al 2010)² took *A. evecta* from Tahiti to Jamaica where like here, it has found the niche to its liking. Along with *D. esculentum* it is becoming somewhat of a pest with the islanders, but of course very interesting to us and to me a little amusing. That such a majestic fern, known as King Fern can escape with our help from its confinement, where in native places like Australia and India it is in decline to expand rapidly into new territory, I personally find fascinating. It was probably first introduced to the Lyon Arboretum in Oahu, Hawaii in 1927 (Mehltreter et al 2010)².

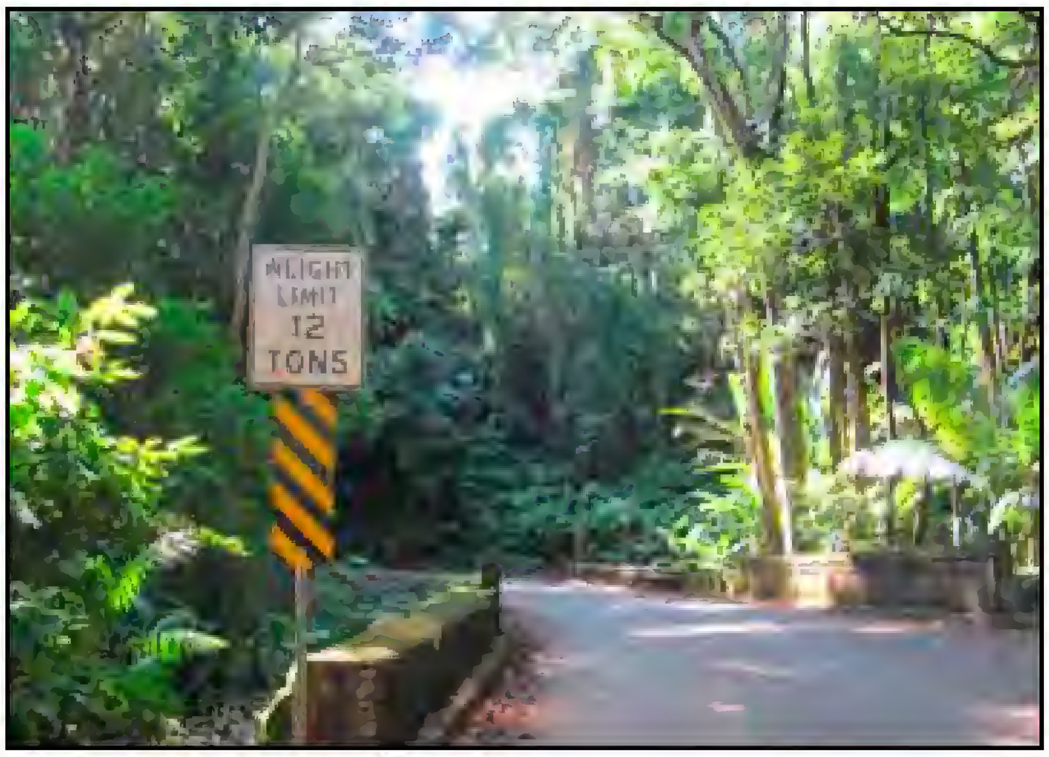

Fig. 8. Looking back to the bridge with *Angiopteris evecta* and *Diplazium. esculentum* covering the far bank under the trees

Driving on to the Akaka Falls State Park we saw more of these two ferns but they were kept a little more in check by the native *Cibotium glauca.* Looking towards the falls from some distance it looked like the two would certainly be dominant in the shady more humid conditions. On the metalled paths around the trail the banks were kept strimmed. At the start of the trail I saw one large *Cyathea cooperi,* a sign of things to come, but, more to the point, anywhere the grass was damp vast colonies of the pan-tropical weed *Deparia petersenii* was muscling in. We have seen this plant take a grip in various places in the world but I guess it is too late for Hawaii where it has taken a real liking for the conditions.

In conclusion if you are visiting Australia or New Zealand do break your journey in Hawaii but be sure to spend more time there than we did. We will, next time we visit our son in New Zealand!

Footnotes

[1] *Hawai'i's Ferns and Fern Allies* Daniel D Palmer
[2] *Fern Ecology* Mehltreter K, LR Walker and JR Sharpe

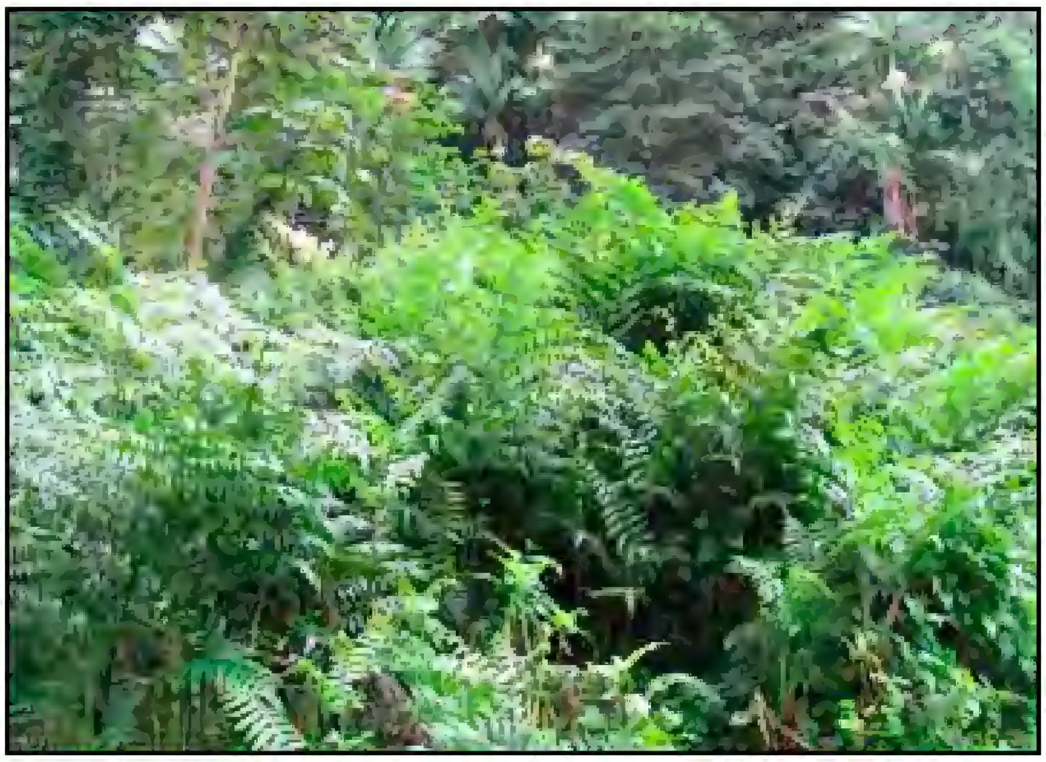

Fig. 9. Close up showing almost total domination of *Diplazium esculentum* in areas of forest margins

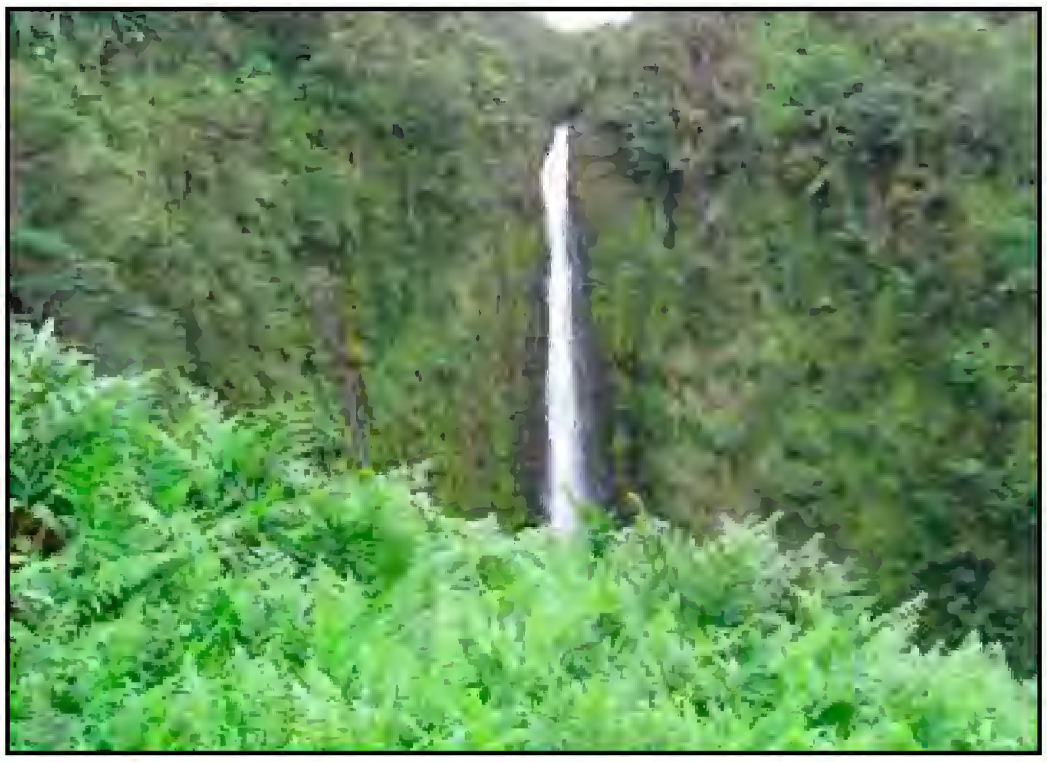

Fig. 10 *Diplazium esculentum* in foreground with *Angiopteris evecta* clinging to almost vertical cliffs 2-300 yards away.

Labelling ferns in the garden

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Like many BPS members I suspect, I have searched for a long time to find a good way to label the ferns (and other plants) in my garden. A fern label particularly helps those of us with ageing memories to remember not only the name of a fern but also where and when it was obtained. A good label should also last for many years. A method that I've been experimenting with might benefit other members.

Some years ago, while I was assisting Matt Busby on the BPS stand at the NEC Gardener's World Show, he introduced me to the Brother P-Touch labelling system which was on offer (at a discount!) on another stand at the show. This system produces labels similar to the Dyno punched-letter strips (for those who remember them), only this time the label is printed on the surface of a strip (self-adhesive on one side) using a small hand-held machine. At the time, Brother claimed the labels were waterproof, fade-free and almost indestructible. The model I use is a Brother P-touch 1250, which uses tape reel cartridges, you enter the text into the machine using a QWERTY keyboard before printing the whole label. The labels I produce are ½ inch wide, white with black text and I used to stick them onto conventional white plastic garden plant labels pushed into the ground. Brother's claims proved true, but the problem was that, while the printed tape remained sound, the plastic labels themselves gradually degraded over a couple of years and subsequently snapped. I needed a different material to which to stick the printed labels.

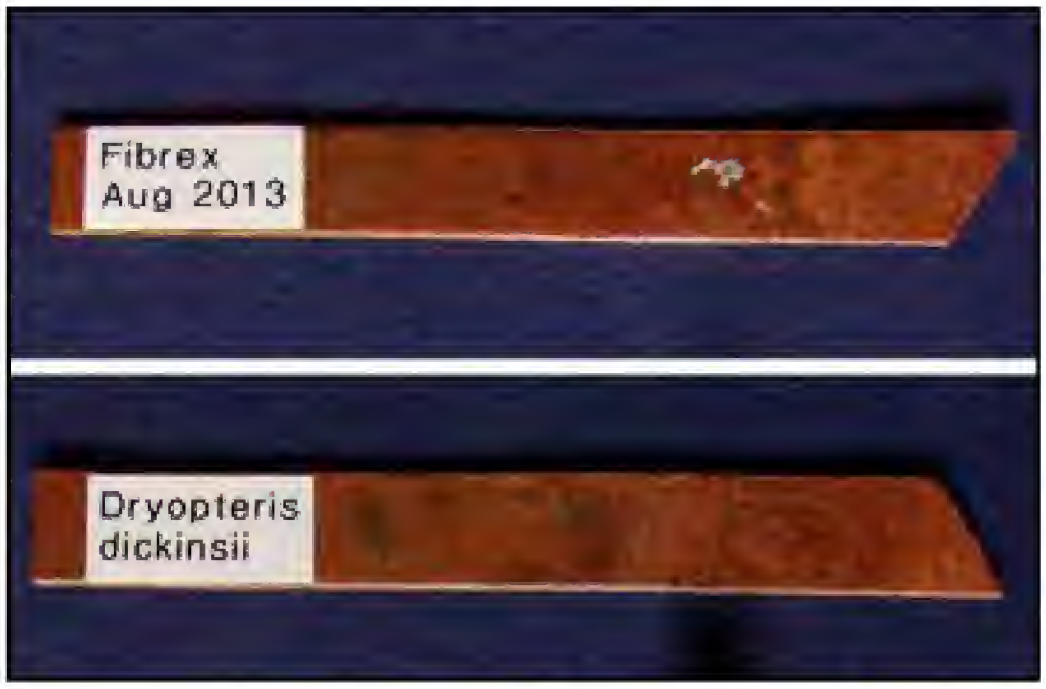


Fig. 2. Both sides of the copper strip using 'Brother' labels which has overwintered in the ground

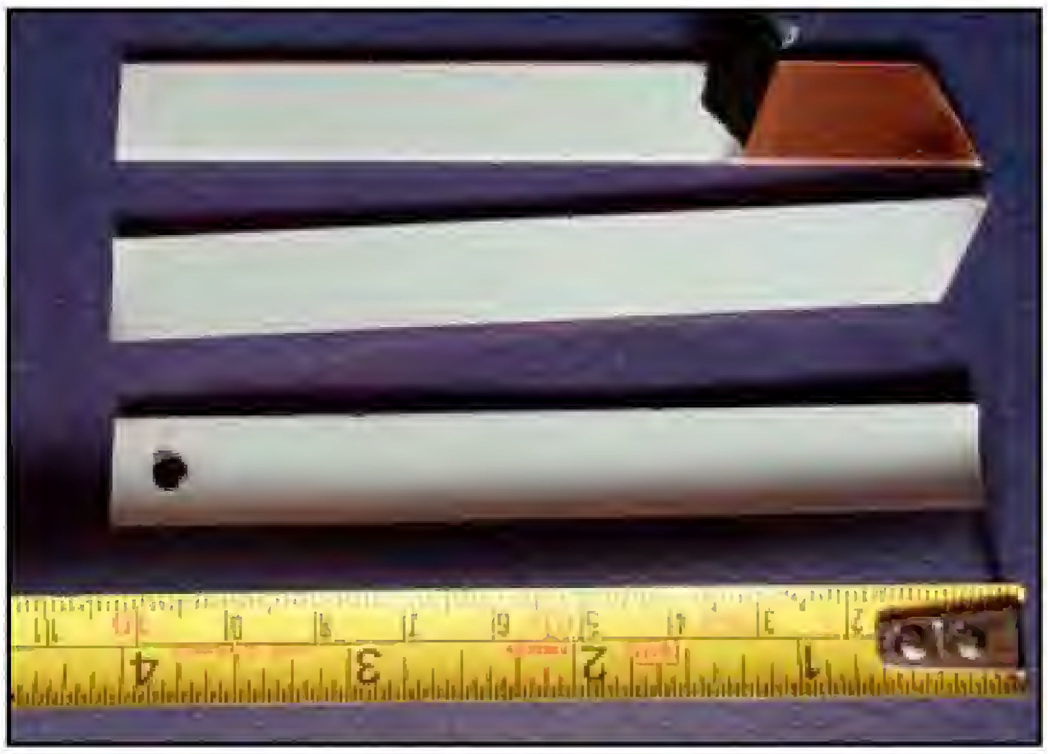


Fig. 1. The copper roofing strip that is normally used to fix loose roofing slates and known as a tingle. This strip has been cut into 3 by using a pair of tin snips

Last year, while reading an issue of Saga magazine (!), I came across an article on how to make garden labels from thin copper sheet, cut into various shapes and tied to a plant or a stake for example. Was this the solution? I felt that thin copper sheet wouldn't be strong enough to push into the ground so looking on the internet for something stronger, I came across copper roofing strips. These are available in different sizes, but on a cost basis I opted for those on eBay from SGS Metals, Littleborough. They are 0.9mm thick, 12mm wide and 300mm long, and cost about 70p each. I cut them using a pair of tin snips into 3 roughly equal lengths of 100mm (Fig.1) and then stick the Brother labels onto them (Fig.2 - label after one winter in the garden). I began my experiment last summer, and while the copper labels are more expensive than the white plastic ones, I have no reason to doubt that the labels will still be sound after many years.

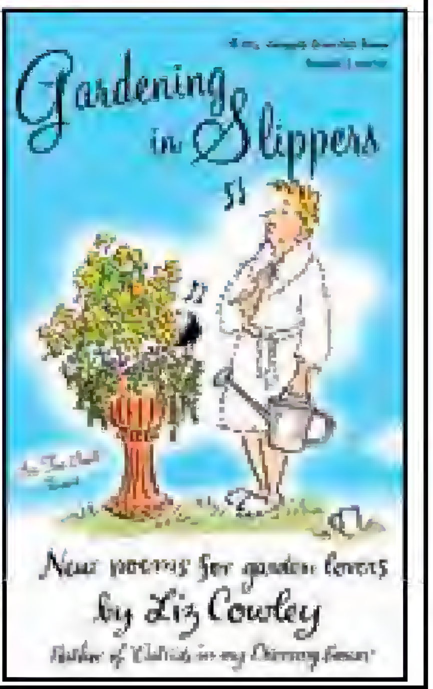
Dear Fern A poem by Liz Cowley, taken from *Gardening in slippers*.

Publisher: Gibson Square Books Ltd ISBN: 978178334075 RRP £9.99

Dear Fern, you earn a place in gardens.
What's more, a place in gardeners' hearts.
You always make the grade in shade,
miraculous in sun-starved parts.
Such lovely whorls, then sweeping fronds
content to live without the sun.
What other shady character
gives back as much?
There isn't one.

Reproduced from:
Gardening in slippers
by kind permission of the author.

This is a light hearted book of verse full of humour and wit which tackles everything from slugs and snails, nosy neighbours and overcrowded flower shows. The author often gardens first thing in the morning, frequently in her slippers. AEG



Preserving a fern collection – and more

Alison Evans

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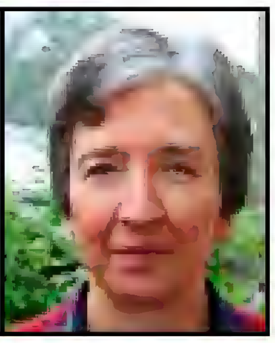

Ken Trewren was no ordinary pteridologist, and his collection of ferns no ordinary collection. In his garden in North Yorkshire, Ken collected different forms of the *Dryopteris affinis* complex, in addition to many other species, hybrids, and cultivars. He had a talent for spotting the unusual – for example he was the first to recognise *Dryopteris pseudodisjuncta* in a British location. He had always seemed to be the fittest person on our botanical excursions, so it was a great shock to everyone when he was found to have a terminal illness in the late summer of 2010. One of his concerns was that his fern collection should be preserved. He was also keen that his work should be continued, particularly in relation to the scaly male ferns. Having looked to Ken for guidance and mentorship, and feeling a strong bond of friendship, several members of the BPS were determined do whatever they could to honour his wishes, in agreement with his wife, Kate, and his family. An early concern was that if we did not have permanent labelling of his fern collection, we would lose the names and origins of important plants in the collection. A grant application was made to the BPS Centenary Fund for this purpose, and last year the labels were placed in the garden in readiness for the National Meeting visit in September. A condition of the grant was that an article on the collection should be written for the *Pteridologist*, to encourage BPS members to visit the collection and to learn from it. My own personal reasons for writing the article, apart from paying tribute to Ken, are to raise awareness of the importance of preserving our fern heritage, and discuss some of the problems that can arise when a fern collection can no longer be looked after by its creator.

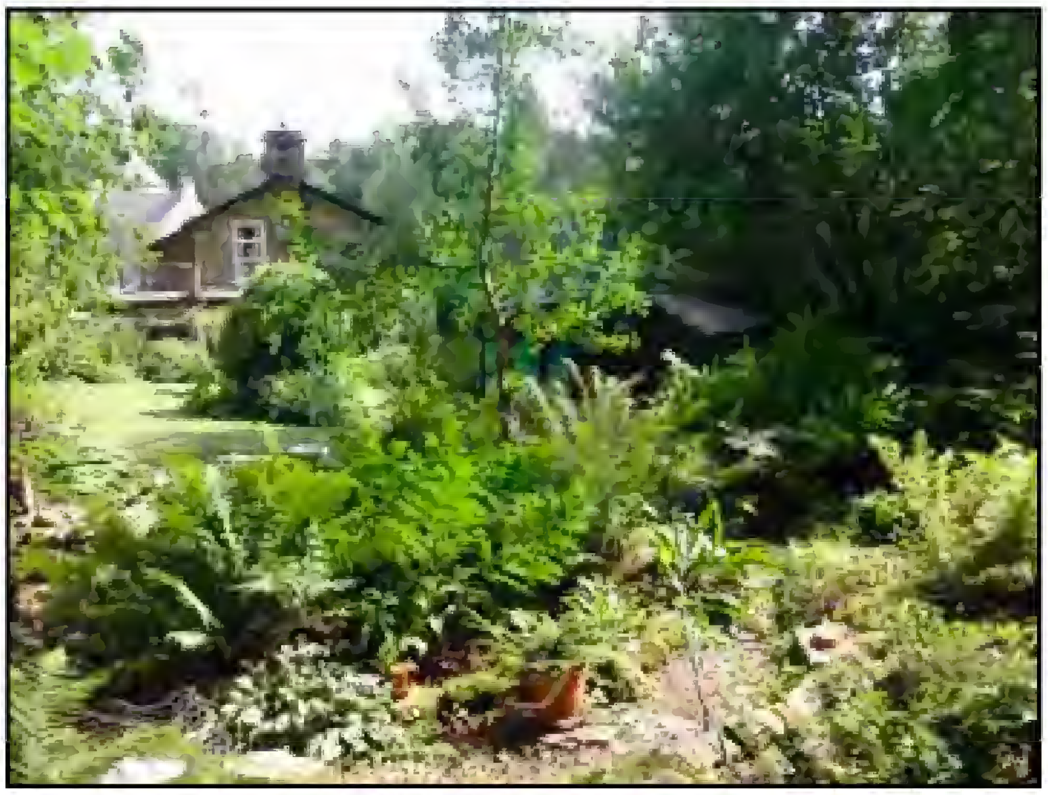

Fig. 1. View of the garden and house, with the flat roof cleared of plant pots

Ken Trewren joined the BPS as a teenager in 1963, and his undergraduate thesis at Bangor University was on British male ferns, strongly influenced by Hugh Corley. Most of Ken's working life as an agricultural researcher was overseas, so his work on British ferns was intermittent until his retirement. He produced a photographic guide to the *Dryopteris affinis* complex in 2007, revising it in September 2009. Many of us printed our own copies of this and used it in the field. Ken grew a collection of British and European taxa of this complex, some of them planted on the steep railway embankment that forms part of the garden. A friendly neighbour allowed him to use an adjacent area of woodland for more *D. affinis* taxa. Ken

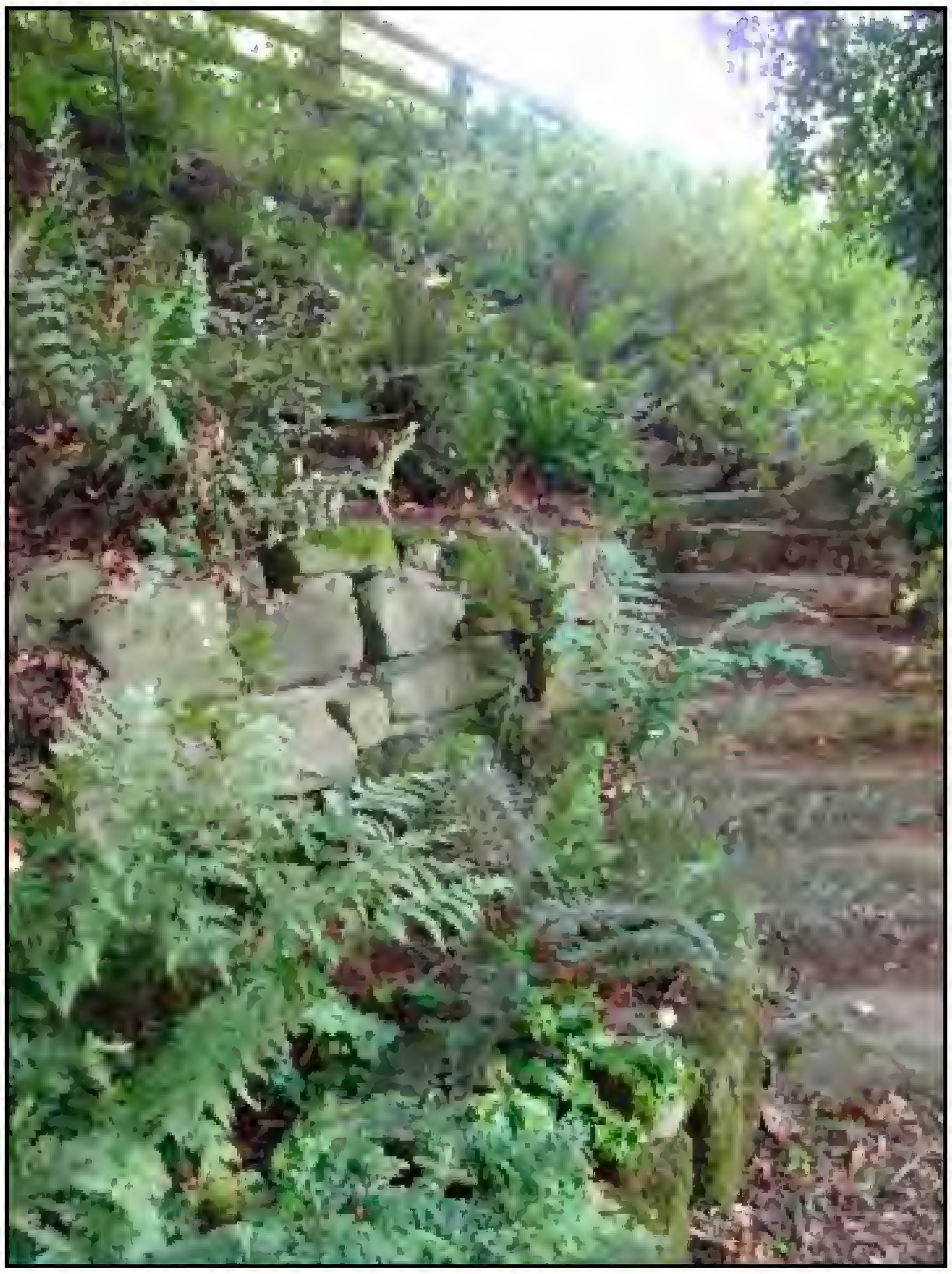

Fig. 2. Part of the embankment fern bed

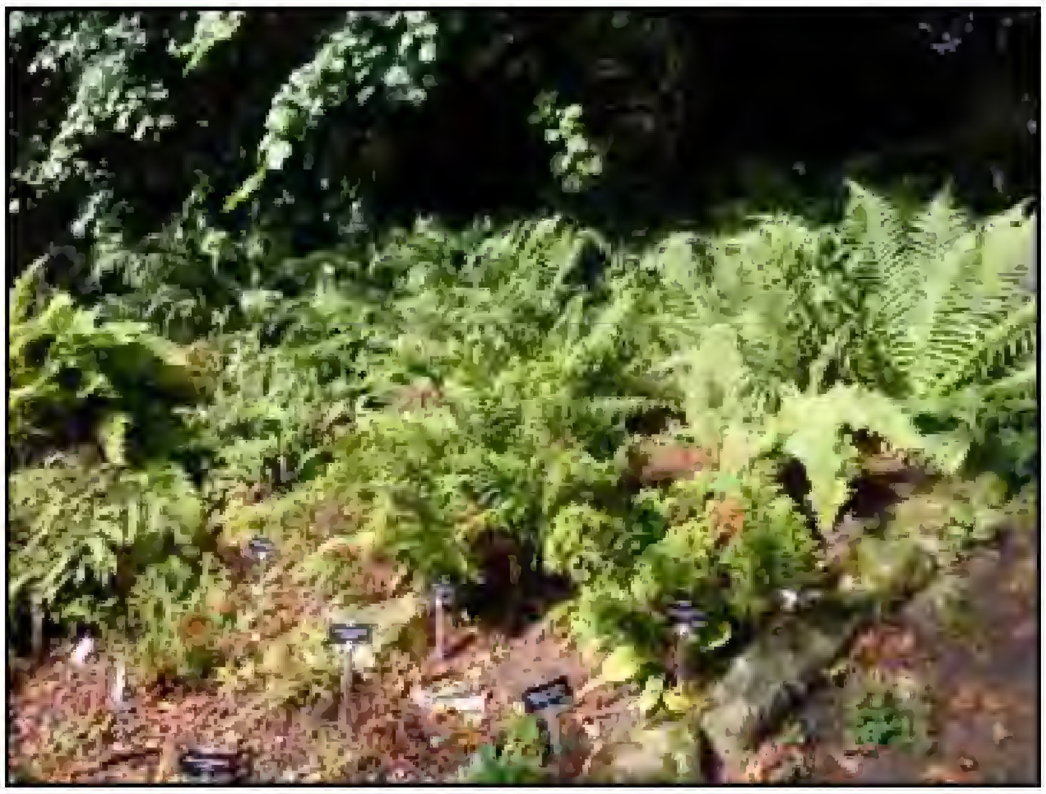

Fig. 3. Main fern bed with labels

Preserving a fern collection – and more

Fig. 4. Left to right: Bruce Brown, Chris Evans and Kate Trewren in the garden

kept planting plans of his main fern beds, the woodland area, and the embankment, but there are also ferny areas such as around the lawn and in a limestone raised bed that we did not find plans for. He also had many taxa in pots, both in the garden and on top of the flat kitchen roof, a cause of concern for Kate! Ken had a fern nursery area on the embankment, as he grew many ferns to share with BPS members and to sell at car boot sales. The end wall of the house has a set of shelves that housed propagators and tanks containing filmy ferns and quillworts.

Following his diagnosis, Ken at first thought that his fern collection should be transferred to a garden open to the public, but there was concern that curators change, and not all are interested in ferns. The decision to maintain the collection in situ was taken jointly by family and friends, with members of the Yorkshire Fern Group offering to help Kate with maintenance. I visited Ken in early October 2010, when he showed me his collection and the garden plans, and asked me to take as many of the potted ferns for sale as I could manage. Although the car was loaded almost to the roof, there were still three or four times as many ferns left behind. The ones I took were distributed to various BPS meetings for sale. Bruce Brown and I planned to visit again the following week, but Ken had a hospital appointment so we were unable to go. Sadly our next visit was for Ken's funeral, and soon after Egton Bridge was cut off by snow, which lasted for about 2 months.

Fig. 5. Chris Evans working on the embankment

The following spring was a story of loss and survival. The glass tanks of filmy ferns and quillworts had cracked and the contents were lost, as were several of the tender plants in the summer house. Many of the sporelings in outside propagators had survived, however, and Bruce Brown and I did what we could to preserve these and pot them up.

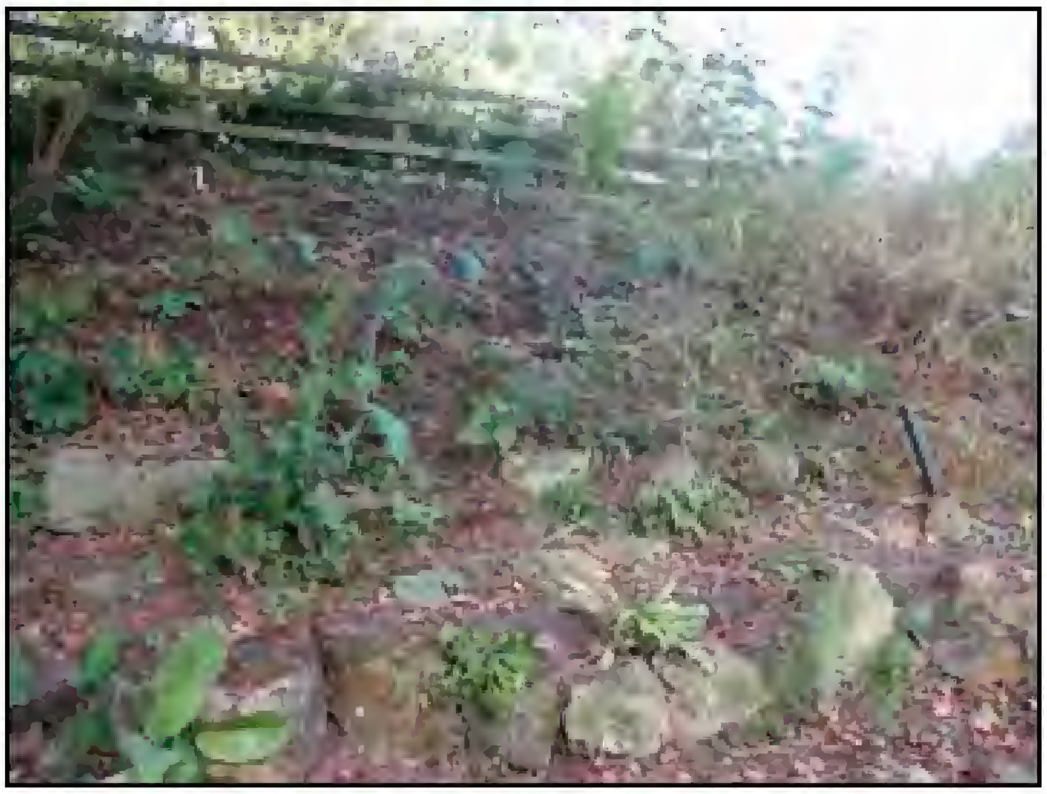

Fig. 6. The embankment after weeding

We live about 2 hours drive from Egton Bridge, so it was not feasible for us to work on the collection there. Several more car-loads were transported back to my home in Earby. Space was quite an issue for me, with every spare surface in my garden and greenhouse covered with pots of young ferns. Undoubtedly some of the plants were 'hardened off' too quickly, and this in conjunction with the weather being unseasonally hot on the day of the 2011 AGM, meant that a batch of the sporelings did not survive long. The other main casualties were the mature plants in pots in the garden, especially the ones on the steep steps on the embankment. The labels of many of these were lost – probably removed by birds, and as we could not keep up with watering, potting-up, or planting out, many of these did not last long.

Fig. 7. Rob Cooke examining a Polypodium

The sporelings from Ken's 2010 sowings were a different matter, and I soon found myself with hundreds of plants of different taxa in the *Dryopteris affinis* complex. The 'affinis' enthusiasts took some, but for many people they 'just looked like male ferns'. An added dilemma is that until they are 3 or 4 years old, it is often difficult to know if they are indeed the taxon indicated on the label. Some of them are formally named taxa, but others have names such as 'Carbis Bay Hybrid' or 'borreri look-alike with affinis indusia'. It is important to know the provenance of these plants, so I needed to be able to access Ken's records. I was fortunate to be able to copy his fern files from his lap-top with Kate's permission. There are photographic and database records of many of the *D. affinis* taxa that he had collected. Kate also asked me to look after Ken's fern documents and pressed specimens until such time as they can be housed in the BPS archive. There is still quite a bit of detective work to do in piecing together the history of some of the plants in the collection.

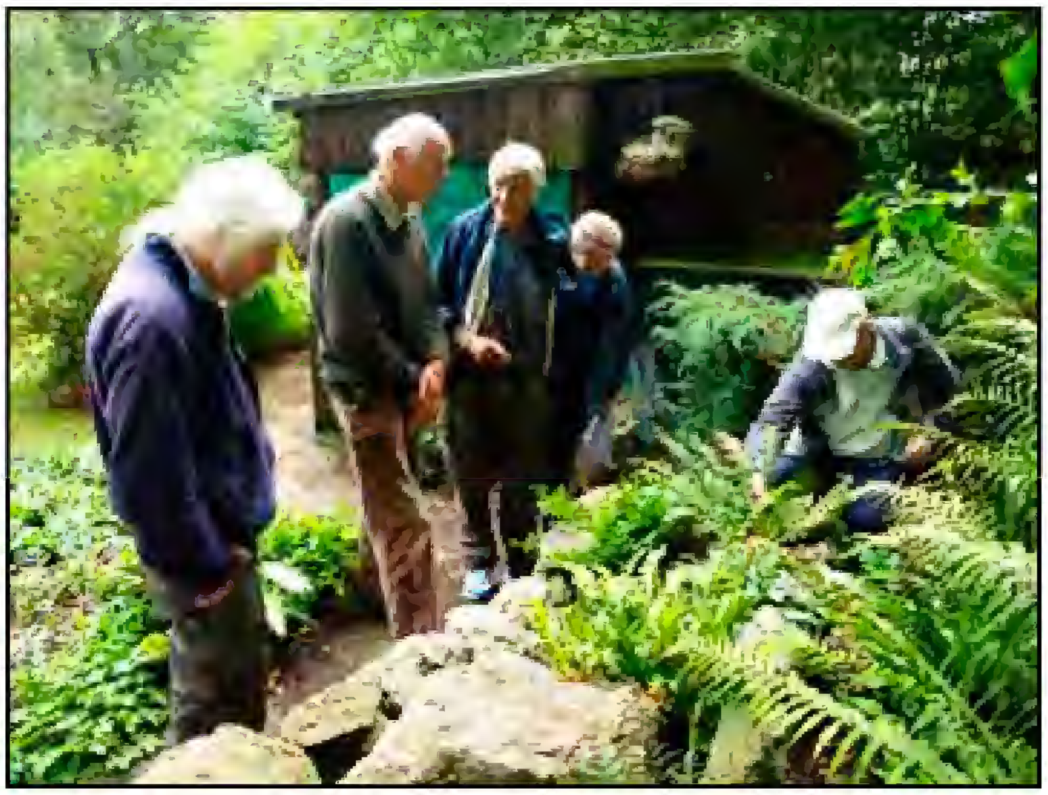

Fig. 8.Left to right: Jesse Tregale, David Tennant, Paul Ripley, Lindsay Holleworth, and Rob Cooke looking at the raised limestone bed, in particular the *Polystichum aculeatum* (Cristatum group) 'Ken Trewren'

The collection of mature plants in the garden has survived well on the whole, thanks to Kate's determined efforts and occasional visits from BPS members. I am particularly grateful to Mary Gibby, Roger Golding, and Bruce Brown for help with confirming the identification of the plants indicated on the garden plans, and with maintenance – thanks also to Chris Evans for helping with the latter. The garden plans needed some revision where plants had either died, or new plantings had been made, but by the time the Centenary Fund grant was awarded in April 2013 we were fairly happy that our revised versions were accurate, and these were rechecked in the summer of that year. Frank McGavigan had already researched the best value in botanical labels for the Arduaine labelling project, so I was grateful for his advice to approach I.P. Engraving for the name labels, and Dave Burlow to make the label stems. The cost of each label and stem was £2.50, extremely good value! Thank you to the BPS Trustees for the grant that made labelling possible, and to Kate for her support and help with this project.

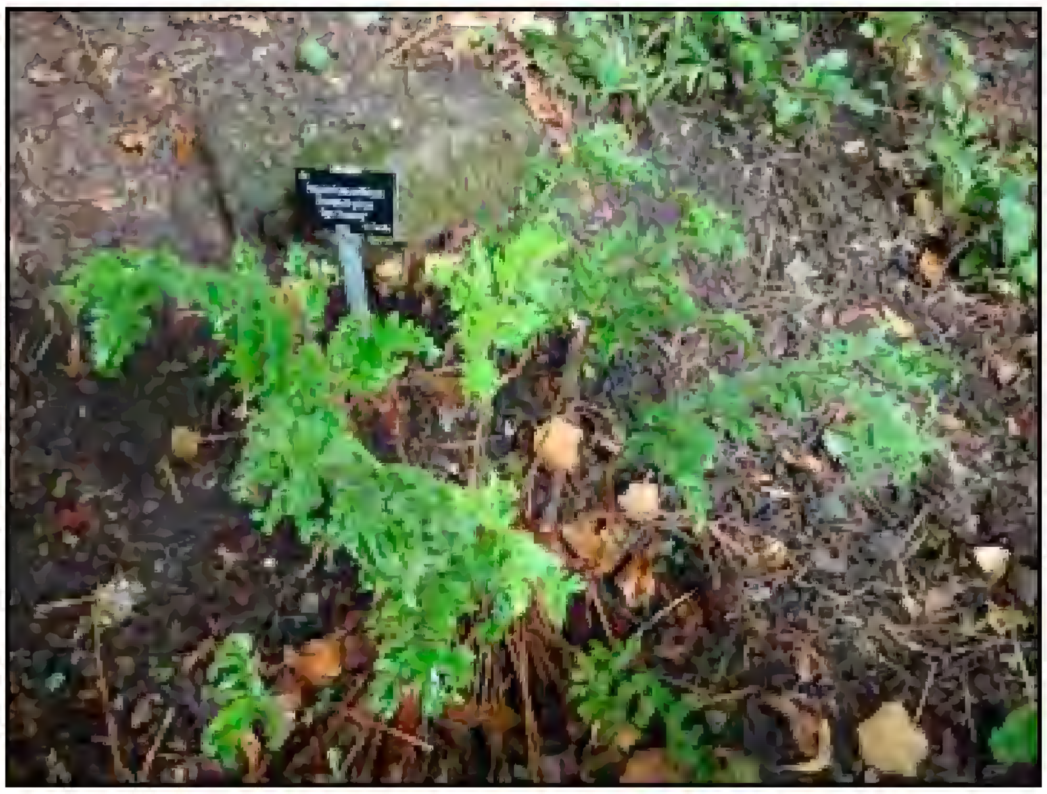

Fig. 9. *Polystichum setiferum* (Cristatum group)

The Yorkshire group hosted a national meeting in Whitby in September 2014, when we visited Ken's garden, and three of his special sites. We were able to use the BPS Special Publication 13, 'Some taxa within the *Dryopteris affinis* complex', by Ken Trewren, to help in our identification of scaly male ferns. Kate made us feel very welcome, with tea, coffee and biscuits always on hand – and we were blessed with good weather. The meeting was a tribute to Ken, but not the end of the story, as there is still work to do on the new taxa he was investigating, on revising his guide in the way he would have wanted, and in continuing to nurture his fern collection. All of us who grow ferns should perhaps think of how our collections may be maintained when we can't look after them, and though it may not be as exciting as spore sowing or planting, to remember that good record keeping is a huge help to those who come after us. ❒

Fig. 10. Left to right: Jesse Tregale, Christine Mullins, Michael Radley, Roger Golding, Kate Trewren, Mike Wilcox, Alison Evans, Rob Cooke, Bob Brown

BPS members may visit the garden by arrangement with Kate Trewren. Details can be found on the BPS website at http://ebps.org.uk/ferns/growing/ferns-members-gardens/list-of-gardens/ken-trewren/

Social Media for Fern Enthusiasts

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There are many different ways to enjoy ferns, whether out in the field, growing them to exhibit at shows or just for your own pleasure at home, collecting fern memorabilia, right through to more scientific study. Not everyone is interested in every single aspect of pteridology, just as not everyone is interested in using social media, preferring to talk to people "in real life." However, social media are becoming just one more way in which fern enthusiasts can meet and share their interest in ferns. This article is an introduction to our social media channels – you may already be familiar with them and know all about how to use websites such as Facebook and Twitter – but this article is aimed at people who want to get more out of their online fern social life, and aren't quite sure where to start.

I am hoping that those of you who do use the internet have already noticed that our BPS website has had a make-over. This was in part to keep pace with our new online presence on various social media websites, and so that we could handle the increased traffic to our own website through people following links for more information. But we also now have a truly interactive website, with a much more detailed fern event diary, a forum contained within the website for fern discussion, and a facility for people to post their own fern articles and pictures in the form of a blog. All our social media channels can be accessed from the home page of the website, by clicking on the relevant icon in the left hand sidebar.

I have often said that there is a society out there for just about everything, and the internet is usually the first place people turn to look for it. So people who are interested in ferns may find us without even having heard the word "pteridology" before! I think this is why it is important for us to have a presence over more than one social media platform, as you never know where the next new member will find us. For this reason we have kept the **Tumblr** blog page alive, even though we now have an inbuilt blogging facility on the BPS website. The website blog is actually more useful for us as individual members (once they have signed up to create content for the website) are now able to add their own posts as and when they like, rather than having to send the information to one person to upload.

FACEBOOK
https://www.facebook.com/pages/Fern-World/158140624207890

TWITTER
https://twitter.com/FernBPS

TUMBLR

http://bpsfernworld.tumblr.com/

So to start with the biggest platform, let's look at **Facebook**. Now Facebook isn't going to be everyone's cup of tea, and that's ok, but it is undoubtedly the largest social media site out there at the moment. According to Pew Research, in 2014 71% of adults who were active online used Facebook. That is a really staggering figure, and shows the size of our potential audience. I know not everyone who uses Facebook is going to be interested in ferns – but if there are people out there who are interested, they will potentially find us on Facebook. As at the time of writing, we had just gained our 300th "liker" on the Fern World Facebook page. Facebook is a place where you can share as much – or as little – about your interests as you feel comfortable with. You do not need a Facebook account in order to look at the Fern World page, but if you want to contact other Facebook users or post on the site, you will need to sign up. Unlike most of the other social media platforms we have, Facebook has a "real name" policy, and if I were to sum it up in a nutshell, it is about creating an online version of who you are, so you can keep in contact with people in your life – past or present. To have a look at Fern World on Facebook and get a feel for what it is all about, you can click on the Facebook icon on the BPS homepage. Of course, if you're already one of those 71% of people using Facebook, why not "like" the page!

Twitter is so far proving to be our most popular social media platform, as at the time of writing we currently have over five hundred followers from all around the world. Twitter is known as a "micro-blogging" site. It is possible to share pictures, videos, and links to pages and articles through Twitter, although in a very concise way. The limiting factor of Twitter is that your post can be no more than 140 characters long. This is because although Twitter can be used on a desktop or laptop computer, it was developed with mobile phones in mind, and back in the olden days 140 characters was the most you could send in a text message! Rather than hinder conversation, this encourages brevity and keeping to the point – and of course conversations can carry on throughout a series of replies.

To include other Twitter users in the conversation, you tag them in your

Social Media for Fern Enthusiasts

post – for example, our Twitter name is @fernbps – so whenever someone wants to share some fern news with us, they would add our name into the Tweet. You can also use a “hashtag” – # – in order to show posts of a certain topic in one stream – for example the popular #fernfriday tag. Anyone can read a Tweet, but in order to post a reply you must be registered with your own Twitter account. Some users choose not to post Tweets of their own, and are content to simply browse through what the people they follow have to say. But lots of people also enjoy connecting with other people who have the same interests, and sharing their own stories, pictures, and experiences about pteridology.

Another social media platform that is largely based around smartphones is the picture sharing site, **Instagram**. Because almost every mobile phone you can buy nowadays comes with a camera built in and a wifi connection to the internet, snapping and sharing pictures while you are on the move has never been so easy. Like Twitter, you can follow other Instagram users, comment on pictures, and tag photos with hashtags to sort them in to topics. Instagram is most commonly used on mobile phones or tablets, but it is also possible to browse from your computer. At the time of writing the BPS Instagram account has over 50 followers and I am sure this figure will continue to grow. Flickr is another photo sharing website, but the focus of this is usually on better quality pictures, taken with a camera and then uploaded via a laptop or computer. Again, people from all around the world – and there are 70 members of the Flickr group so far – can share and discuss pictures of ferns.

PINTEREST

https://www.pinterest.com/fernworld/

Pinterest is a virtual pin-board, where users – or “pinners” – share pictures of things that interest them, usually with links to other websites for further information. As with all these social media sites it is possible to browse Pinterest without signing up for your own account, but in order to make your own pin-boards you will need to register. The people who would find Pinterest most interesting are the collectors of fern related artefacts, prints, fabrics, ceramics, glassware etc., although there are also plenty of informational and scientific pins on there. One thing I have found interesting since I started the Pinterest page is just how many people there are out there that really love ferns, and have made their own boards dedicated to them. These people are our potential audience! Using social media is a great way to make contact and let the world know we exist.

All of the social media sites I have mentioned have detailed “how to” guides and helpful information about getting started, so if you are interested, why not give it a go? ❐

Reference

Pew Research Centre : http://www.pewinternet.org/2015/01/09/social-media-update-2014/

FLICKR

https://www.flickr.com/groups/2681067@N23/

Pterry The-Fern

Used as a logo for Fern World, the online newsletter.

http://issuu.com/pterrythe-fern

INSTAGRAM

https://instagram.com/britishpteridologicalsociety/

Latest scientific research

Keep up to date with recently published scientific research on ferns and lycophytes. A new feature on our BPS website is a page listing new publications as they are released.

The list will be updated weekly to include the newest articles. Each entry has a link to the abstract and in some cases the complete article.

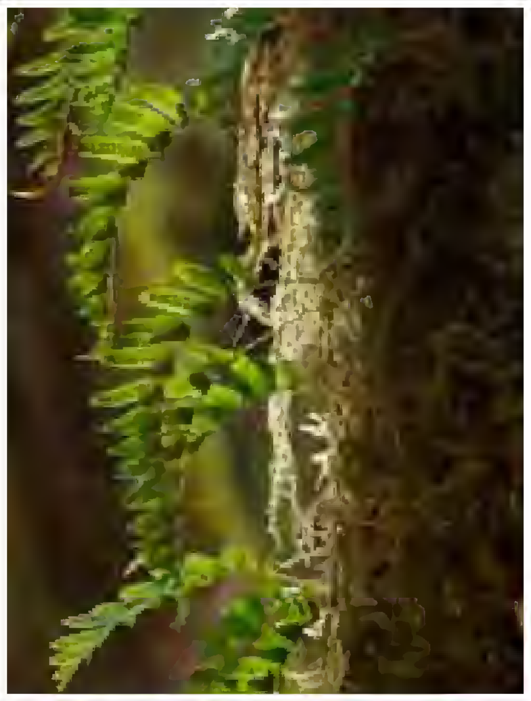
To find this webpage on our website, look under ‘Education’ for ‘New Research’.

The BPS Photographic Competition 2015

This year the BPS ran their second Photographic Competition. The aim is to encourage members to take photos of ferns in the wild, in the garden or greenhouse and of any ferny artefacts, so these can be enjoyed by others. All photos sent in will appear on our website and the winners are published here. The photos may also be used to produce our BPS calendar.

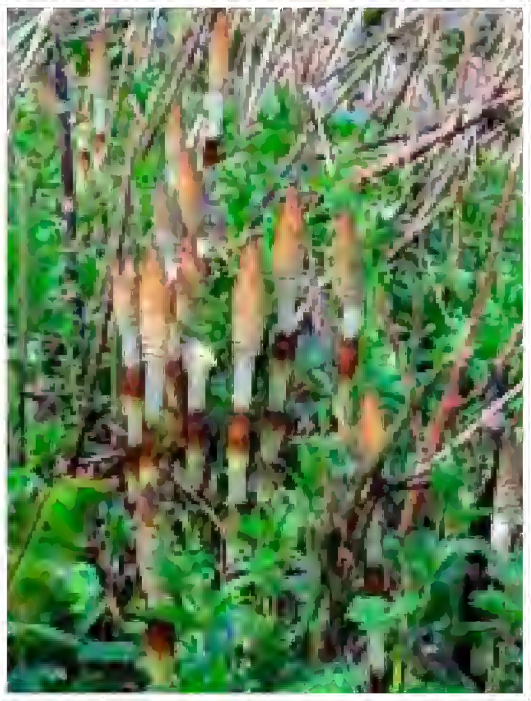
The competition attracted 8 entrants submitting 44 photos. These were displayed at the AGM where members voted for their favourites. We hope that many of you will be enthused and submit photos for next years competition; look out for the instructions in the Autumn Mailing. Remember Photos win Prizes!

Class 1 - Ferns in a natural landscape

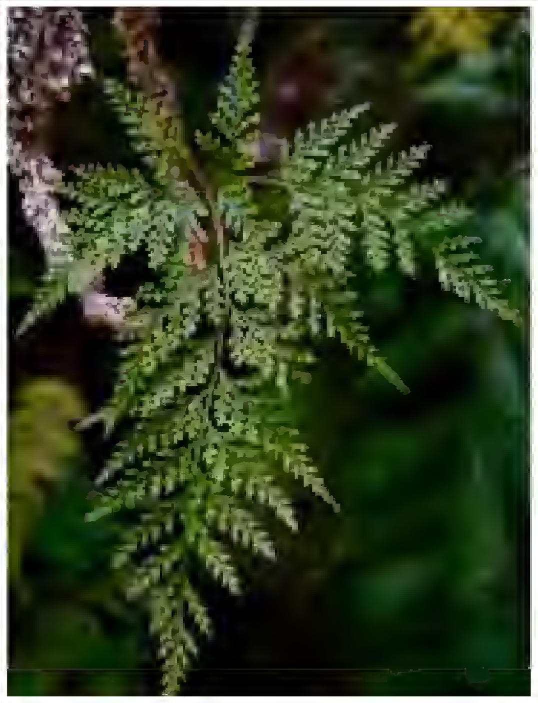


← 1st
Sue Olsen
Polypodium glycyrrhiza
Oregon

2nd →
Sue Dockerill
Equisetum telmateia
Gower, South Wales
April 2014

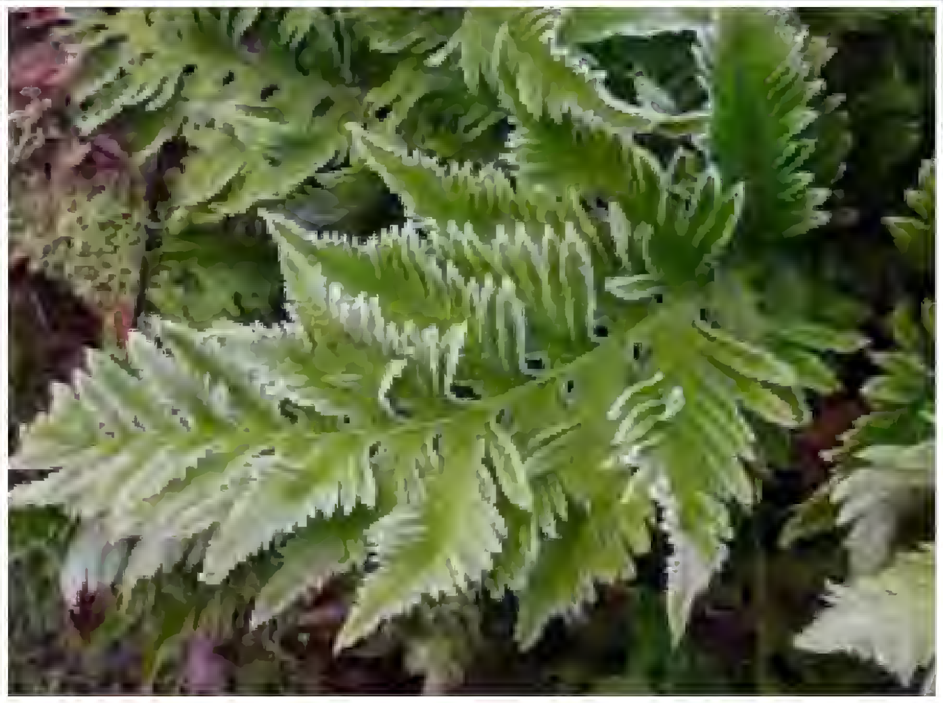


Class 2 - Cultivated ferns in a house, greenhouse or garden

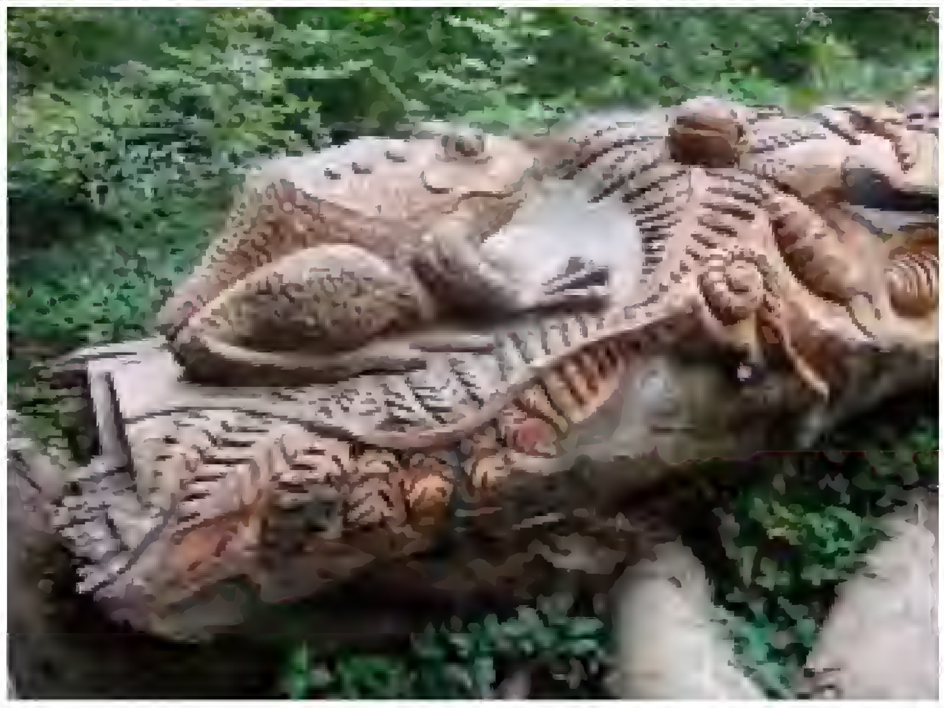


← 1st
Paul Sharp
Davallia mariesii
Ascog Fernery, Isle of Bute
April 2015

2nd →
Alison Evans
Polypodium cambricum
Springfield House, Earby
December 2014

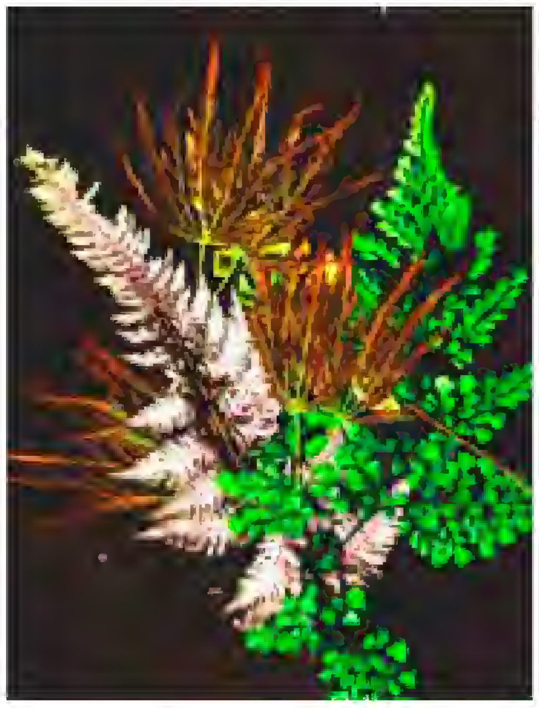


Class 3 - Item or object with a fern-related theme



← 1st
Alison Evans
Fern carving on felled tree
Nymans Woods, Sussex
August 2014

2nd →
Sue Olsen
Wall Hanging



On overall votes, over the three classes, the winners are as follows:

Winner: Alison Evans
Runner-Up: Sue Olsen

Congratulations to them both and to Sue Dockerill and Paul Sharp for some stunning photographs.

Grave matters...

Alison Paul

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A stroll around Ross-on-Wye took us through St Mary's churchyard to admire the splendid view out across the Wye Valley. On the way back an interesting gravestone just south of the church caught my eye. It is without doubt the best and most attractive fern-decorated stone that I have seen.

It is quite unusual, the ivy-clad cross/'trunk' arising from a mound of 'rocks' joined with 'mortar' from which the ferns are 'growing'. Whilst the hart's tongues (*Asplenium scolopendrium*) are portrayed particularly realistically, the identity of the other species is debateable, though the frond dissection suggests young plants of male fern (*Dryopteris filix-mas*).

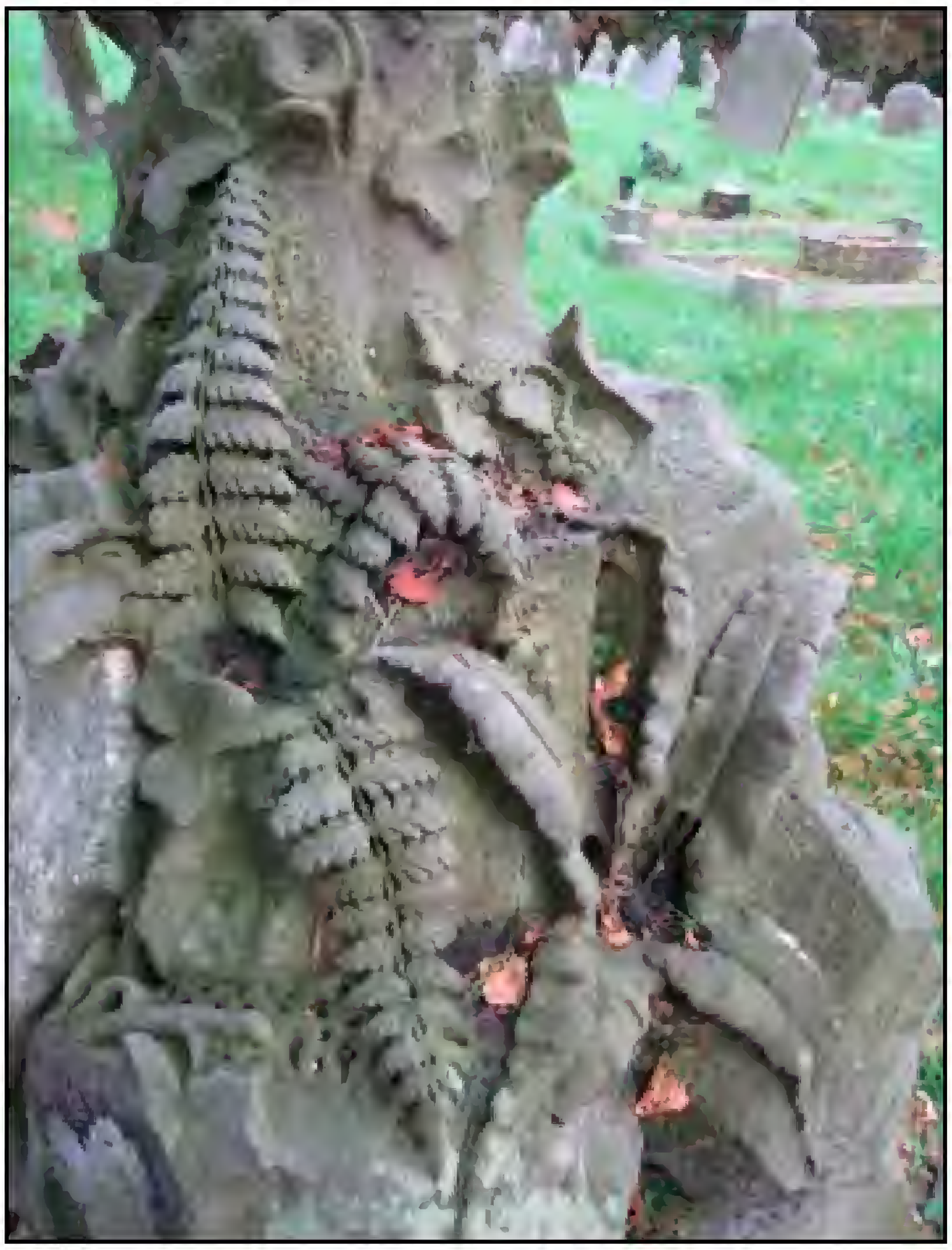

Fig. 1. Detail of the gravestone showing *Asplenium scolopendrium* very clearly and possible male ferns

Surely the deceased must have been a fern enthusiast to inspire such a memorial? Unfortunately, both inscriptions are extremely hard to read due to a combination of weathering and unusual lettering. One can make out 'Mary Augusta' on one of them, but I couldn't decipher a date. Enquiries of the clergy and local history society failed to reveal any information, so I contacted a local firm of undertakers. They kindly visited the gravestone and concluded that it is likely to date from *c.* 1927 and is probably Forest of Dean stone. Martin Rickard wondered if it could be H. Relton's grave; he was a BPS member from 1910 until his death in 1926/1927 and lived at several addresses near Ross for about seven years. "One of his houses was a rather magnificent small mansion at Ganerew, so he could have afforded a good stone." However, records in *The British Fern Gazette* show that Relton moved to the Lizard in 1920/1921, so this seems unlikely unless he asked to be buried in Ross. Another possibility is that it is the grave of Relton's wife or sister. It is interesting to speculate!

Heather McHaffie's 2003 *Pteridologist* article *Churchyard ferns* ends: "... it is unusual to visit an old burial ground without finding at least one interesting work of art to occupy and please the pteridologist." My chance discovery bears this out. Have you explored your local graveyards? ❐

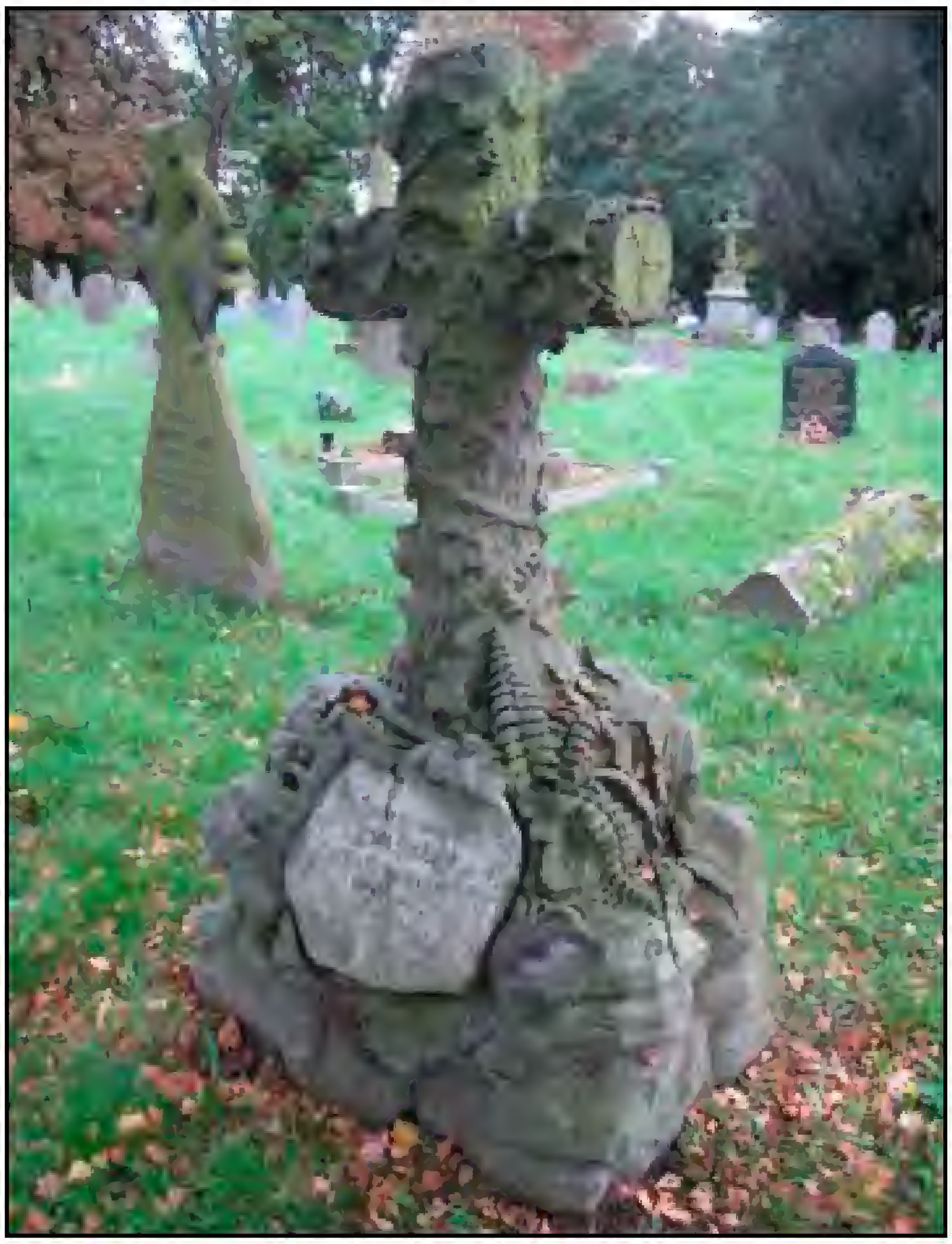

Fig. 2. General view of this most attractive gravestone showing the ivy-clad cross with various ferns. On the other side is another hart's tongue. Regrettably the two inscription panels are very weathered

For other examples of churchyard ferns see:

McHaffie, H. (2003). Ferns in grave situations. *Pteridologist* 4(2): 42-43.

Mitchell, J. (2005). Rev. John Stuart of Luss d.d., f.r.s. (1743-1821). *Pteridologist* 4(4):123.

Zenkteler, E. (2004). Graveyard ferns in Poland and Lithuania. *Pteridologist* 4(3): 65.

With grateful thanks to Keith Ellis, Funeral Director, Dawe Brothers, Ross-on-Wye, to The Rev'd Sarah Jones, St Mary The Virgin, Ross-on-Wye, to Simon Clarke of Ross-on-Wye Past and Present, and to Martin Rickard for his suggestion about Relton.

Book Review

(Replacing that in Pteridologist 2014 which contained a non-trivial error)

Fougères rustiques: pour le jardin by Olivier Ezavin & Cédric Basset (2013). pp. 224. 22 x 17 cm. 24€
Les Éditions Ulmer, 8 rue Blanche, 75009 Paris, France. ISBN: 978-2-84138-528-7

On the back cover of *Pteridologist*, for many years now, Olivier Ezavin, the first author of this book, has advertised his fern nursery *Le Monde des Fougères* (The World of Ferns). It is located a short distance inland from Nice and the Eastern Mediterranean coast of France. I have visited there twice, by bus, when holidaying near Nice. The co-author, Cédric Basset is an expert in botanical photography and specialist in Asiatic floras. Together, Ezavin and Basset have produced a beautifully- and profusely-illustrated book with much useful advice on ferns and how to grow and appreciate them.

Fig. 1 shows the front cover. *Fougères rustiques* is a practical guide (in French), to hardy (*rustique*), ferns (fougères) that are recommended as suitable for French gardens. Many are also widely planted in British gardens but several are definitely not, and might be well worth re-testing in protected micro-habitats.

Fig. 1. Front cover.

The book starts with a general introduction to ferns; their evolutionary origin, diversity, anatomy and reproduction. A major theme is how ferns can provide counterpoint to the flowering plants. It is thus intended for keen gardeners whose horizons haven't yet intersected with pteridology but who might respond to 'frondly' persuasion.

The main part of the book is an *A to Z Guide* of 100 species of ferns, native and foreign, that are hardy, from a French perspective. They are presented in alphabetical order of Latin name, and authority, from *Adiantum capillus-veneris* (L.) to *Woodwardia unigemmata* [Makino] (Nakai). As a sample of the presentation, Fig. 2 shows *Woodwardia radicans*, a native French species. The authors must have wanted to avoid producing the truly massive tome that would be needed for all the native French species of fern, plus the several hundred foreign species that might, or do already, grow in France. Instead, with a book-thickness of only 2-cm, and containing 224 pages, the authors had to be highly selective.

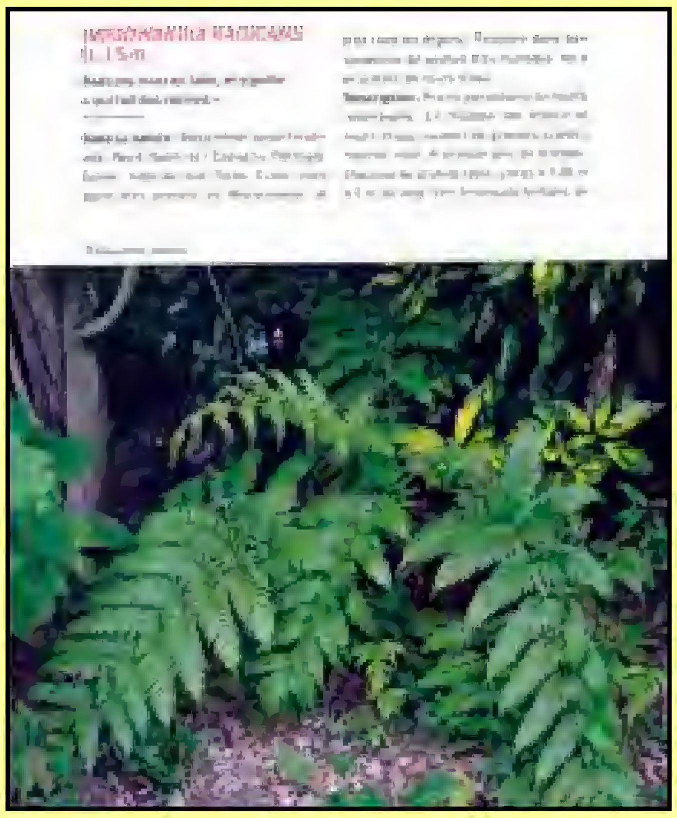

Fig. 2. *Woodwardia radicans*, a native French species.

For example, in the genus *Asplenium*, there are 22 French-native species listed in Rémy Prelli's (1990) *Guide des fougères* (2nd Ed., Paris, Lechevalier). From these, Ezavin & Basset offer only 3, namely *A. adiantum-nigrum*, *A. scolopendrium* [plus 4 cultivars], and *A. trichomanes* [2 sub-species and 3 cultivars].

Similarly with *Dryopteris*, Prelli describes 15 native-French species, from which the A to Z Guide has taken only 4 as follows, with [cultivars]: *D. affinis* [7], *D. carthusiana*, *D. dilatata* and *D. filix-mas* [4]. This then made space for 6 species, foreign-to-France, of *Dryopteris* representatives from North America and Asia.

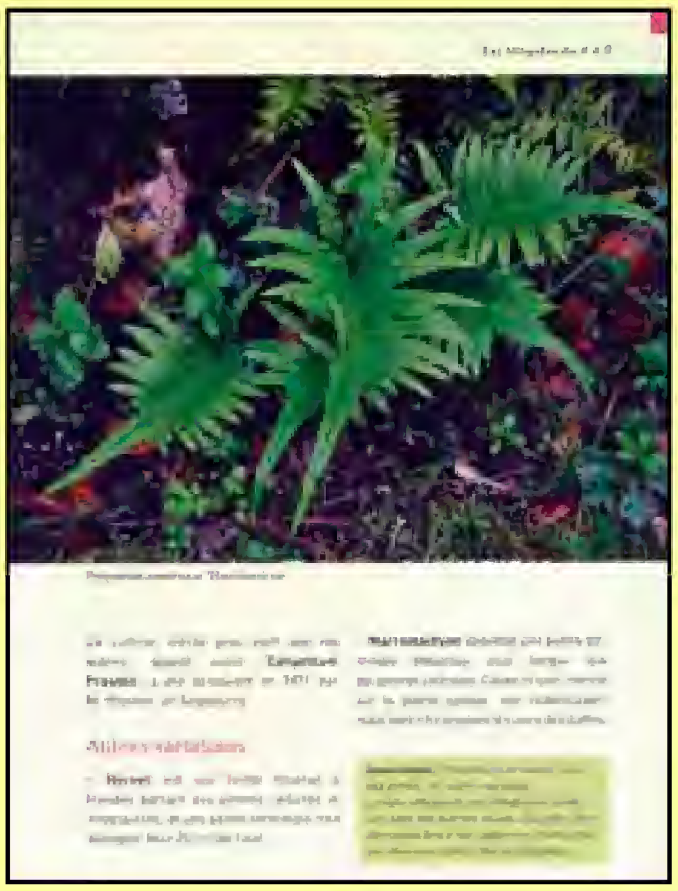

Fig. 3. *Polypodium cambricum* 'Macrostachyon'

Overall, the A to Z Guide has more fern species that are foreign to France than it has French natives, in a ratio of about 70 to 30. With the cultivars, which are mainly from species native to France (and shared with the British Isles), many, if not most, were from Britain (Fig. 3).

Each entry in the A to Z Guide has a species-description, with the systematic name and authority, synonyms, natural occurrence and distribution. There is then a listing of the distinguishing anatomical features, one or more coloured illustrations, and expert advice on cultivation.

For readers who want the lowest temperatures each species can withstand, there is a 4-page *Tableau de Rusticité* (Hardiness Table) for the 100 fern species described. These temperatures range from the -2°C of *Pteris vittata* down to the -40°C of *Cystopteris fragilis*.

Many of the species and cultivars described in the book do well in British gardens. However there is a goodly proportion which may be '*rustique*' (hardy) in France, but would be vulnerable in many parts of Britain.

These are the species which Ezavin & Basset cite as being hardy down to between -5°C and -10°C. In Britain, these might need specially-protected micro-habitats to survive our periodic exceptionally cold or long winters. The book offers a fair number in this category, of which – as a sample – only those under the letters A, B and C are: *Adiantum hispidulum* [-6°C], *Blechnum appendiculatum* [tested to -5°C], *B. australe auriculatum* [-6°C], *Colysis eliptica* [to -8°C], *Coniogramme japonica* [-8°C] and *Cystopteris diaphana* [-8 °C].

Those British fern-growers with only school-level or holiday-level French should not let the foreign language be a deterrent. I found that only a short crib-sheet of technical-botanical words from a dictionary was enough for reasonable understanding. The text is concise and straightforward and unburdened by convoluted phraseology. The numerical hardiness information doesn't need much translation anyway. and the pictures speak for themselves.

Fougères rustiques has at the end a short Bibliography and 'Webographie', and lists of fern gardens and specialist fern nurseries in France. It is well indexed.

The book has a certain inspirational quality and offers a master-class in how to take and display appealing pictures of ferns. Its horticultural advice struck me as accurate and insightful.

At 24€, it is modestly priced for its size and its lavish use of colour. I recommend it for its French perspective on choosing and growing garden ferns, and enthusing on their aesthetics.

Alastair Wardlaw

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